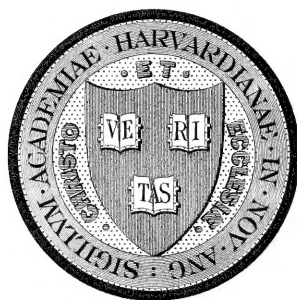


ENT
2658

HARVARD UNIVERSITY

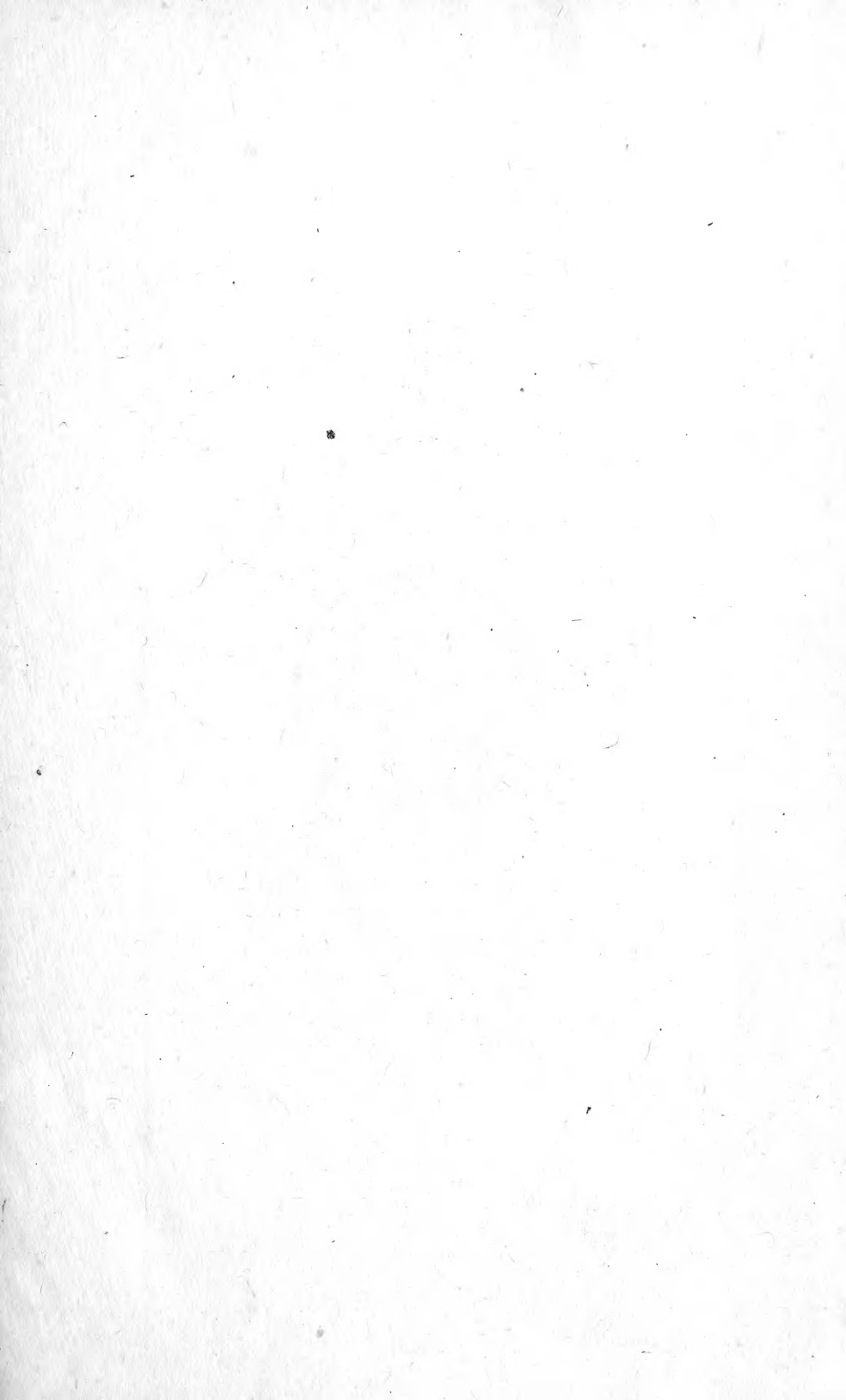
LIBRARY
OF THE
MUSEUM OF COMPARATIVE ZOÖLOGY

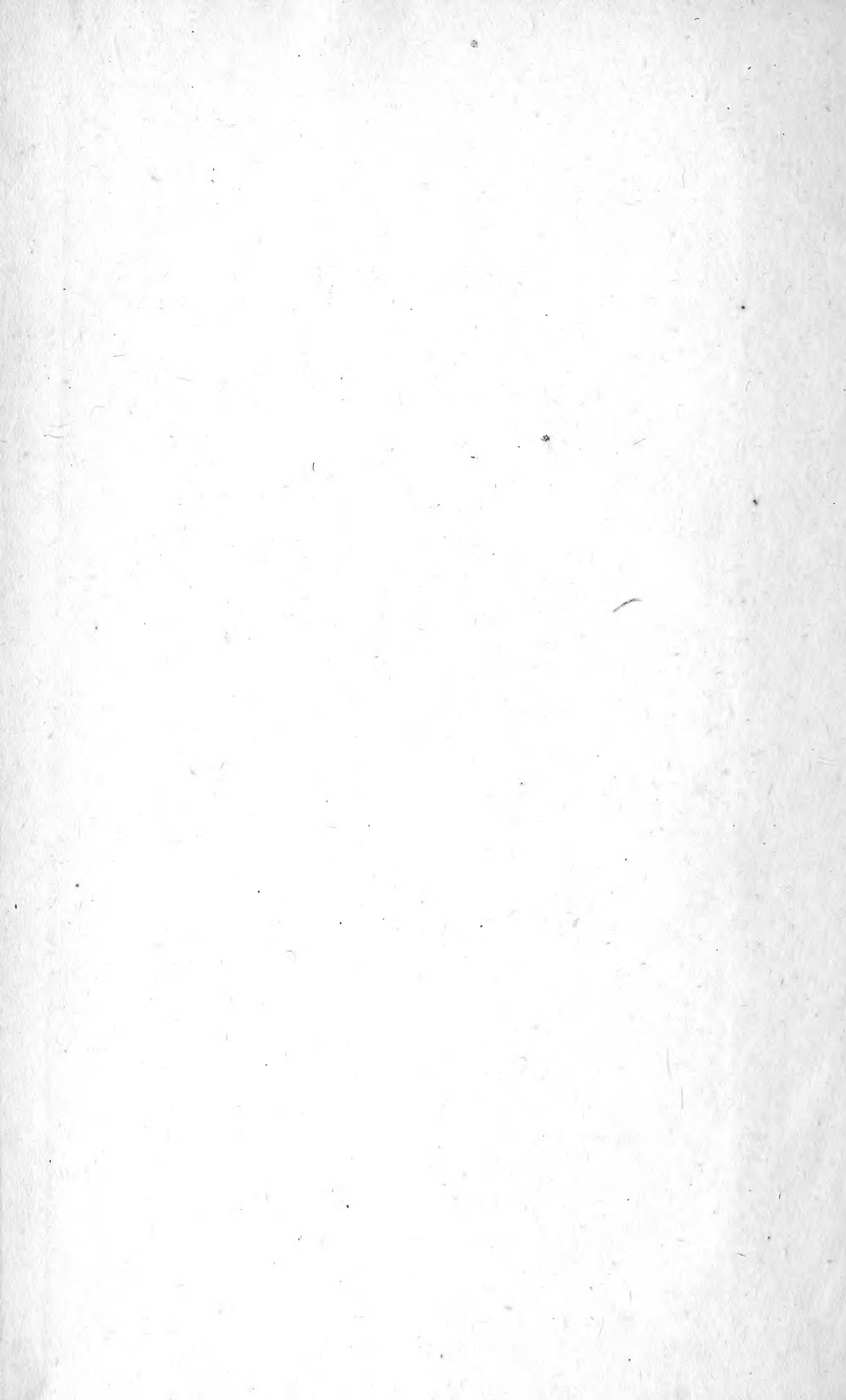


FROM THE
WILLARD PEELE HUNNEWELL
(CLASS OF 1904)
MEMORIAL FUND
13,820

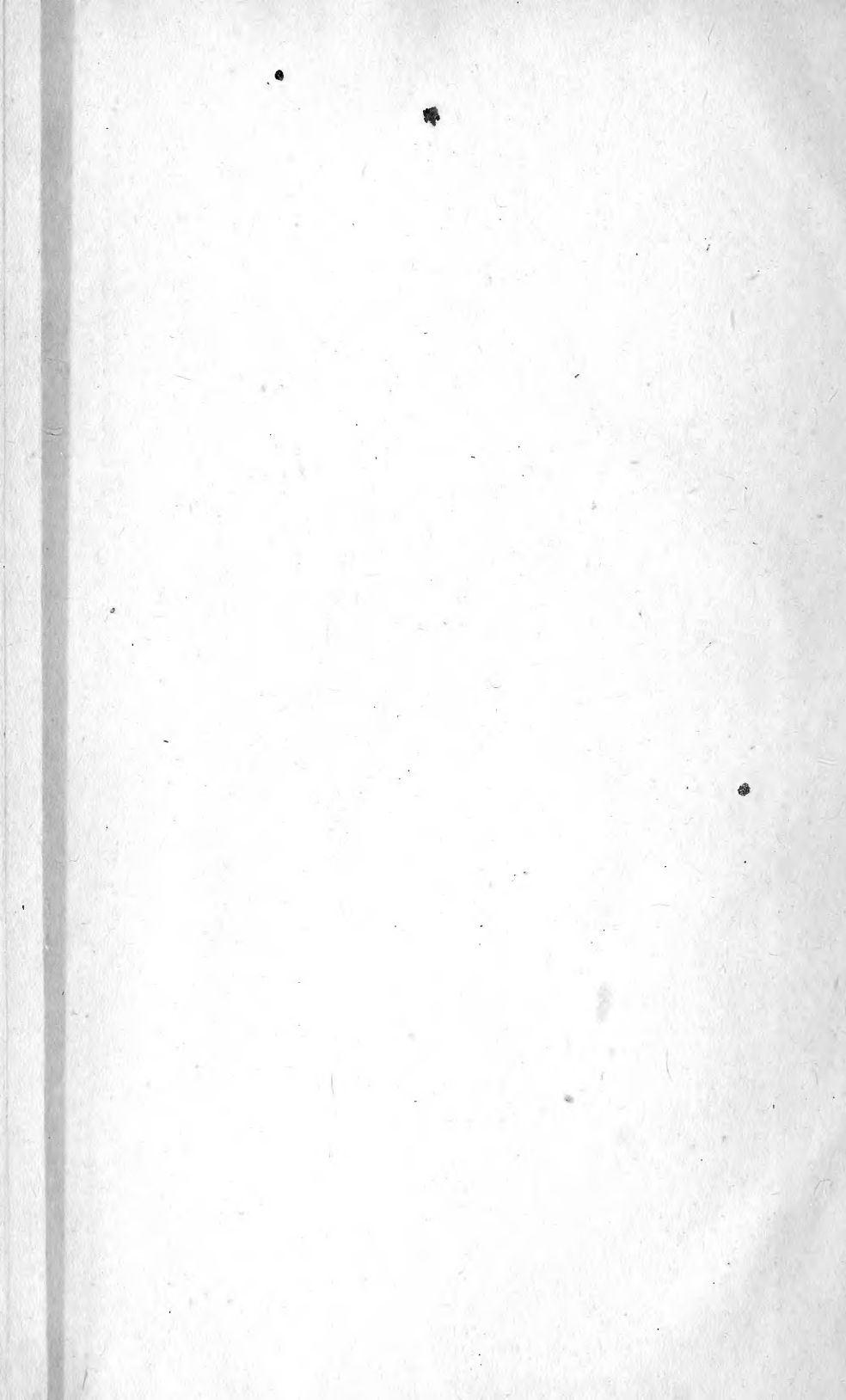
The income of this fund is used for the purchase of entomological books

February 12, 1919 - February 25, 1920.









THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.
GEORGE T. BETHUNE-BAKER,
F.L.S., F.Z.S., F.E.S.
M. BURR, D.SC., F.L.S., F.Z.S., F.E.S.
(REV.) C. R. N. BURROWS, F.E.S.

T. A. CHAPMAN, M.D., F.R.S., F.E.S.
JAS. E. COLLIN, F.E.S.
H. ST. J. K. DONISTHORPE,
F.Z.S., F.E.S.
JOHN HARTLEY DURRANT, F.E.S.
ALFRED SICH, F.E.S.

(REV.) GEORGE WHEELER, M.A., F.E.S.,

and

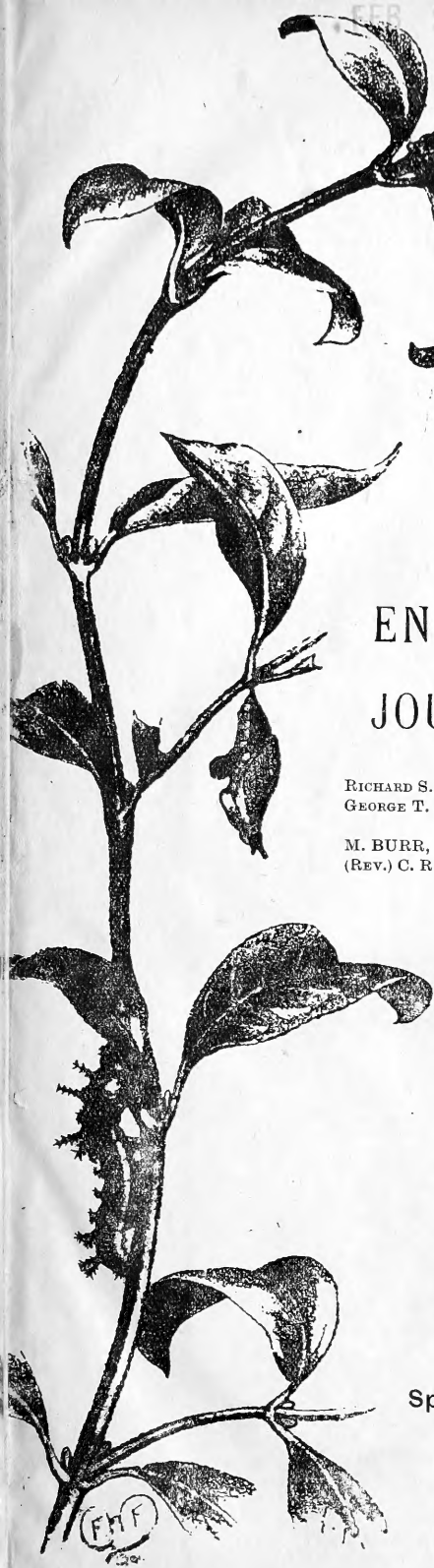
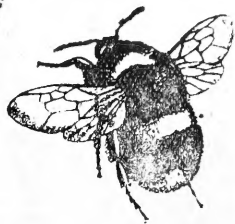
HENRY J. TURNER, F.E.S.,
Editorial Secretary.

VOL. XXXI.

JANUARY to DECEMBER, 1919.

PRICE 12s. 6d.

Special Index (with every reference), 1s. 6d.



YBARGU
MUSCOWS
CAMBRIDGE

Subscriptions for 1919 (10/- post free) should be sent to H. E. Page, "Bertrose,"
Gellatly Road, S.E. 14.

Vol. XXXI.

13,820

No. 1.

The Entomologist's Record AND Journal of Variation

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.
T. HUDSON BEARE, B.Sc., F.E.S., F.R.S.E.
GEORGE T. BETHUNE-BAKER,
F.Z.S., F.L.S., F.E.S.
M. BURR, D.Sc., F.Z.S., F.L.S., F.E.S.
(REV.) C. R. N. BURROWS, F.E.S.

T. A. CHAPMAN, M.D., F.R.S., F.E.S.
JAS. E. COLLIN, F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.
JOHN HARTLEY DURRANT, F.E.S.
ALFRED SICH, F.E.S.
J. R. EE B. TOMLIN, M.A., F.E.S.

(REV.) GEORGE WHEELER, M.A., F.E.S.,

and

HENRY J. TURNER, F.E.S.,

Editorial Secretary.

CONTENTS.

	PAGE.
Myrmecophilous Notes for 1918, <i>H. Donisthorpe, F.Z.S., F.E.S.</i>	1
Collecting in various places in 1916-18, <i>Capt. P. P. Graves, F.E.S.</i>	5
Notes on British Ectobius, <i>Steph., Capt. Malcolm Burr, D.Sc., F.E.S.</i>	8
A New British Capsid (Hemiptera), <i>E. A. Butler, B.A., B.Sc., F.E.S.</i>	9
New Species of Aristotelia and Micropteryx, <i>Right Hon. Lord Walsingham, M.A., LL.D., F.R.S.</i>	10
SCIENTIFIC NOTES AND OBSERVATIONS:—Food-plant and Rearing of <i>Hydroecia crinanensis</i> , (<i>Rev.</i>) <i>C. R. N. Burrows, F.E.S.</i>	12
NOTES ON COLLECTING:—Field Notes from Bath, <i>A. Sich, F.E.S.</i> ; Some Aculeate Hymen- optera from Leicestershire in 1918, <i>Lieut. L. A. Bor</i> ; <i>Abraxas grossulariata var.</i> <i>exquisita, G. T. Porritt, F.E.S.</i>	14
CURRENT NOTES AND SHORT NOTICES	17
SOCIETIES:—The South London Entomological Society	18
SPECIAL INDEX	i. xvi.
SUPPLEMENT (still further delayed).	

JANUARY 15th, 1919.

Price TWO SHILLINGS (NET).

Subscription for Complete Volume, post free

(Including all DOUBLE NUMBERS, etc.)

TEN SHILLINGS,

TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,

"BERTROSE," GELLATLY ROAD, NEW CROSS, S.E. 14.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/5, 2/2, 2/6, 3/2. Folding Nets, 3/9, 4/3, 4/9. Umbrella Nets (self-acting), 7/- . Pocket Boxes (deal), 7d., 10d., 1/2, 1/10. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/- . Nested Chip Boxes, 9d. per four dozen, 1 gross, 2/- . Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/- . Sugaring Tin, with brush, 1/6, 2/- . Sugaring Mixture, ready for use, 1/7 per tin. Store-Boxes, with camphor cells, 2/3, 2/9, 4/- 4/6, 5/6, 6/8. Setting-Boards, flat or oval, lin., 6d.; 1 1/2 in., 8d.; 2 in., 10d.; 2 1/2 in., 1/-; 3 1/2 in., 1/4; 4 in., 1/6; 5 in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 10/6, 12/9; corked back, 15/9. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/9, 4/6, 5/6, 8/3. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/9 to 11/- . Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3 1/2, 1/2 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/6. Glass-top and Glass-bottomed Boxes, from 1/3 per dozen. Zinc Killing Box, 9d. to 1/- . Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d., 1/-; Blowpipes, 4d., 6d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families and for all insects liable to become greasy.

We stock various sizes and lengths of these Silver Pins which have certain advantages over ordinary entomological pins (whether enamelled black or silver or gilt).

NESTING BOXES of various patterns which should be fixed in gardens or shrubberies by lovers of birds before the breeding season.

SHOW ROOM FOR CABINETS

Of every description for INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS &c.

Catalogue (84 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).
Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTEEN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.

Bexley

L. W. NEWMAN

[Kent]

Has for sale a superb stock of 1918 specimens in fine condition, including Varleyaria; Bicuspis; Pendularia var. Subroseata; Melanic forms Lariciata, Consortaria, Consonaria, Abietaria; Irish forms Aurinia and Napi, fine vars. Tiliae, Yellow Dominula, etc., etc. Quotations and Insects sent on approval with pleasure.

Also a huge stock of fine PUPÆ and OVA.

Write for latest price lists.

NOTICE:—Owing to huge rise in cost of metal, etc., my **Relaxing Tins** are now **3/6** small and **5/6** large, post free.

GALLS AND PIERCED BRAMBLE AND BRIER STEMS.—MR.

L. A. BOX would be very grateful for any sorts and quantities, with localities, from all parts of the United Kingdom.

80, Northampton Road, Croydon.

The Entomologist's Record

AND

JOURNAL OF VARIATION.

VOL. XXXI. No. 1.

JANUARY 15TH, 1919.

Myrmecophilous Notes for 1918.

By H. DONISTHORPE, F.Z.S., F.E.S.

Mr. A. W. Pickard-Cambridge having asked me to overhaul and name the ants belonging to his father, the late Rev. O. Pickard-Cambridge, I have now done so, and propose to publish a list of the same. Very few of them have locality labels attached, but Mr. Cambridge tells me that it may be taken for granted that all those without were taken in the Bloxworth district.

Myrmecina graminicola Latr. ♀ and ♂.

Monomorium pharaonis L. ♀ "Sailsbury." New County record.

Myrmica laevinodis Nyl. ♂♂, ♀♀, and ♂♂.

Myrmica ruginodis Nyl. ♂♂, ♀♀, and ♂♂. New County record. 1 ♀ labelled "Blox. Heath, Sept. 1885."

Myrmica sulcinodis Nyl. ♂♂, ♀♀, and ♂♂. "Bloxworth Heath." Among these I detected an interesting ergatandromorph, which Mr. Cambridge has generously given to me. It may be described as follows:—

Head reddish brown, mandibles yellow, antennæ and cheeks red, thorax light yellowish red, petiole and post-petiole red, gaster partly red, partly dark brown, legs red.

Whole body except gaster mostly normal ♀. Head less rugose than in normal ♀, thorax with rugose striae not longitudinal, but slanting on prothorax, and transverse and rounded on mesothorax. Epinotal spines slightly shorter than in normal ♀. Gaster deformed looking, triangular; 1st segment divided into three parts, the section on right side rounded, blackish brown, very shining, and covered with hairs, the centre section only visible on dorsal surface, small, light brown and glabrous, the left section lighter to darker brown with a few hairs, continued over most of the ventral surface where it meets the section from right side. The next three segments on dorsal surface are light brown and shining, with rows of hairs near apex, and two small parts of the ventral segments on left side. The 4th segment appears to form a continuous ring, which is slightly split at apex, and from it a bit of a 5th segment is visible. One stipes, the sagittae, and a sting are extruded from the latter segment. Long. 5.5mm.

Myrmica scabrinodis Nyl. ♂♂, ♀♀, ♂♂.

Myrmica scabrinodis Nyl. var. *sabuleti* Mein. ♂♂. New County record.

Stenamma westwoodi West. 4 ♂♂.

Leptothorax acervorum L. ♂♂, ♀♀, and ♂♂.

Leptothorax tuberum F. ♀; and ♂♂ "Portland."

Tetramorium caespitum L. ♂♂; are labelled "Blox. Heath."

JANUARY 17TH, 1919.

- Wasmannia auropunctata* Roger. ♀ ♀; "Kew Gardens."
Tapinoma erraticum Latr. ♀ ♀.
Acanthomyops (Dendrolasius) fuliginosus Latr. ♀ ♀ and ♀ ♀.
Acanthomyops (Donisthorpea) niger L. ♂ ♂, ♀ ♀, and ♀ ♀. One deālated ♀ has the scale rather deeply emarginated; it is clearly, however, only *niger*.
Acanthomyops (Donisthorpea) alienus Först. ♂ ♂, ♀ ♀, and ♀ ♀.
Acanthomyops (Chthonolasius) flavus F. ♂, ♀ ♀.
Formica rufa L. ♀ ♀, ♀ ♀.
Formica pratensis Retz. ♂ ♂, ♀ ♀, and ♀ ♀.
Formica fusca L. ♂, ♀ ♀, ♀ ♀. 3 winged ♀ ♀ and 2 ♂ ♂ on one card are labelled "Blox., Poole Rd., Aug. 9th, 1915." Probably a marriage flight.
Formica fusca L. var. *glebaria* Nyl. ♀ ♀.

MYRMICINAE.

Myrmecina graminicola Latr.—My interesting little colony of this ant, which I have had in my possession for over 8 years, is still in a flourishing condition; very many deālated ♀ ♀, ♀ ♀ and larvæ being present to-day (November 6th). Winged ♀ ♀ have been produced in it, for the fourth year in succession, this year; though in less numbers than in previous years. ♂ ♂ however appeared in great numbers. The first ♂ appeared on May 27th, and the first winged ♀ on June 30th. The last ♂ died on October 7th. Most of the ♀ ♀ removed their wings in about a month's time, but one still retained her wings on August 25th, when she was observed to help to carry the larvæ. During the first week in July the ♂ ♂ exhibited signs of wishing to leave the nest, by being restless and running and flying all over the nest. On September 17th a ♂ was observed trying to copulate with a dead ♀, and he persisted in his efforts for a considerable time.

Myrmica laevinodis Nyl. var. *ruginodo-laevinodis* Forel.—The Rev. E. E. Woodruff-Peacock sent me specimens of this variety taken at Cadny, N. Lincs. (June, 1917), which is a new county record for the same.

Myrmica scabrinodis Nyl. and var. *sabuleti* Mein.—Specimens of this species and variety were taken at Church Stretton, Shropshire, by Mr. Leman (September, 1918), who kindly gave them to me. They are both new county records.

A large colony of the variety, found by me at the foot of a post in the New Forest on July 18th, contained very many winged ♀ ♀, but only ♂ pupæ. Some of the winged ♀ ♀ were observed to carry the pupæ into safety. On July 28th the colony was visited again, when numerous ♂ ♂ had hatched. One specimen taken home and mounted, is peculiar in that there are apparently no nerves visible in the wings.

Leptothorax acervorum F.—Mr. Butterfield sent me, among other ants to name, a gynæcoid ♀ of this species, which was running on a rock at Rumbold Moor, Yorks (March 20th, 1918), and a very curious ♀ taken in a mixed nest of *L. acervorum* and *Myrmica ruginodis* at Mauley Bog, Keighley (April 26th, 1918). This is a small deālated ♀ of *L. acervorum*, rather dark in colour, and is exceeding remarkable in that it possesses no trace of either a petiole or a post-petiole! The gaster is joined directly on to the epinotum by the small neck which

joins the post-petiole to the gaster in normal ♀ ♀. It measures 3.8mm. in length.

Tetramorium caespitum L.—A number of colonies were observed, when I was in the New Forest in July, which were mostly situated in sandy banks; one little nest, however, which was situated by the side of a road, consisted of a small cone, about $1\frac{1}{2}$ in. high, built of tiny pebbles. This ant also occurred in some of the flower beds in the Beaulieu Road Hotel garden. All the nests contained winged ♀ ♀ and *Beckia albina*; in one nest only a ♂ occurred.

A large colony was dug up on July 17th, to serve as an observation nest at home, which contained many winged ♀ ♀, numerous ♂ ♂, eggs, larvæ, and pupæ. The Aphid *Paracletus cimiciformis*, both alate and apterous, was present in numbers. A Coccid (unfortunately subsequently lost), and a Spider which the Rev. J. E. Hull tells me is *Acartauchenius (Mecynargus) longulus* Kalezynski ♀, occurred in the ants' galleries. This may be the same species which I have previously recorded as *Acartauchenius scurrilis* Camb., and which I discovered new to Britain with the same ant near Rame Head, Cornwall (April 19th, 1909) [*Proc. Dorset N.H. and A.F. Club*, **31**, 55, 69 (1910)]. On June 11th and 12th, 1913, I captured specimens of the same spider, also with *Tetramorium caespitum*, on Lundy Island [*Ent. Rec.*, **25**, 268 (1913)]. As to the synonymy I am of course unable to express an opinion; but Wasmann records *Acartauchenius scurrilis* Camb., with the same ant from Bohemia and the Rhineland.

A specimen of *Staphylinus stercorarius* Ol., was dug up from the very bottom of the nest. Wasmann has recorded *S. stercorarius*, chiefly with *T. caespitum*, in Luxemburg, where he always found it deep in the nests. The beetle preys on the ants. I have one other record of it with *Tetramorium* in Britain, when it was taken at Dover in August, 1910, by a friend of Mons. Bondroit. In the *Ent. Record* for 1913 [**25**, 90 (1913)], I gave a list of all the captures known to me of this beetle, with other ants, in Britain.

[It may be worth while to mention here that my friend Mr. W. E. Sharp tells me that on August 4th, 1918, at Crowthorne, after he had been watching a marriage flight of *Acanthomyops (Chthonolasius) umbratus*, a fine specimen of *Staphylinus latebricola* emerged from one of the holes in the lawn, whence all the winged ants had been pouring. There are also a few other records of *S. latebricola* having been taken with ants in Britain.]

CAMPONOTINÆ.

Acanthomyops (Dendrolasius) fuliginosus Latr.—The virgin ♀ *fuliginosus* which was accepted by my *umbratus* ♂ ♂ on September 3rd, 1915 [see *Ent. Rec.*, **33**, 23 (1918)], is still alive and in good health to-day. I have recorded that I strengthened the nest with *niger* pupæ, and published the condition of the colony up to December 31st, 1917. In 1918 the *umbratus* ♂ ♂ (all the rest of those brought up from Weybridge having been added to the nest), started to kill the *niger* ♂ ♂, and by May 19th only one remained, this being killed before the end of the month.

The *fuliginosus* ♀ gradually got very swollen again, and on May 27th a small bunch of eggs had been laid, which was held up by several *umbratus* ♂ ♂. June 16th, two packets of eggs were present; no more

were laid, however, and on July 7th only a few eggs were to be seen. The ♂♂ evidently devoured them, as on August 1st (on my return home from the New Forest) neither eggs nor brood of any kind were to be seen. The ♀ remains swollen and is surrounded by a large court of ♂♂; but no more eggs have been noticed. Both the *Amphotis*, which have lived in the nest for over two years and six months, are alive and well to-day.

[I may mention that the following Acari occurred on the *umbratus* ♂♂: *Cillibano comata* Leon, on gasters of some ♂♂; *Urodiscella philoctena* Janet, on the strigils; *Antennophorus uhlmanni* Hall, on the chin; and *Uropolyaspis hamuliferus* Berl., on the femora. I am indebted to the Rev. J. E. Hull for the name of the last species. It is the mite I have previously recorded as *Uropoda ovalis* Kram., having been misled by Janet's description and figure [*Ent. Rec.*, 23, 63 (1911), 24, 38 (1912)]. I took it first at Weybridge, in 1910, and subsequently at Woking, always with *A. (C.) umbratus*, and always fastened to the femora of the ants.]

It is a curious fact that *A. (D.) fuliginosus* is very rare in the New Forest. One would expect that such a locality, with its numbers of large old trees and stumps, would be an ideal spot for this ant; such, however, is not the case. The late G. R. Waterhouse recorded a colony at Brockenhurst, in 1856, and Dr. Sharp tells me he knew of one once, which disappeared some time ago. I have always been on the look out for it, but it was not until this year that I ever found it there. On July 17th I noticed ♂♂ of *fuliginosus* running along in files on the fence, just near the bridge above the railway at Beaulieu Road. On looking more closely, I found this was a most interesting mixed colony, as ♂♂ of *A. (C.) mixtus* were walking along with the *fuliginosus* ♂♂, and I subsequently found that the colony consisted of $\frac{2}{3}$ of the *fuliginosus* to $\frac{1}{3}$ of the *mixtus*. [*A. (C.) mixtus* has not been recorded from Hampshire before.] The two species were quite friendly together, tapping antennæ and saluting each other when they met on the tracks, and also when placed together in small tubes. I found that the tracks led right down the brickwork of the bridge to the ground beside the line. It was really a beautiful sight, when the sun was shining, to see the jet black *fuliginosus* and yellow *mixtus* marching in files up and down the wall of the bridge and saluting each other when they met. As *mixtus* is very subterranean in its habits, it must have learnt from the *fuliginosus* to march in files in the open. The tracks also led to and from a thick bramble grove growing by the side of a fence along the buttress of the bridge, and here the nest was evidently situated. I was unable to dig up the nest, as it would have caused the destruction of the fence, which was in a rather dilapidated condition. As it was, the railway people evidently thought I wished to blow up the bridge, as I was always digging under and round about it, in search of the nest. I found both species entering holes in the larger posts of this fence, which were surrounded by the brambles. A large red Coccid—*Leucaniium persicae*, occurred in some numbers on the bramble stems, which no doubt attracted the ants. This was evidently a case where a *fuliginosus* ♀ had founded her colony in a nest of *mixtus*. It was a pity I was unable to get at the nest itself to prove if only a *fuliginosus* ♀ was present, or whether a *mixtus* ♀ also occurred; though I do not think the latter supposition probable.

The only myrmecophiles found were *Othius myrmecophilus* and several *Oxyptoda vittata*, in the runs of the ants. A specimen of *Homalota liturata* was taken walking with the ants on the bridge. A *mietus* ♂ was observed carrying a very small Aphid in its jaws.

(To be continued.)

Collecting in various places in 1916-1918.

By CAPT. P. P. GRAVES, F.E.S.

EGYPT.

In 1916 and 1917 Rhopalocera were commoner than usual in Egypt. This was owing, I believe, to the combination of two high tides, which supplied more summer water to the usually thin vegetation of the edges of the cultivated area, with two comparatively rainy winters, which brought out more vegetation than usual in the Desert Wadis. Further, I think that the restriction of cotton cultivation for maize and various pulse, in 1915 and 1916, contributed to the abundance of the three common Lycænids, which are never rare in Egypt, viz., *Lampides boeticus*, *Tarucus telicanus* var. *egyptiaca*, and *Zizera karsandra*.

The ordinary "skippers"—*Gegenes nostrodamus*, *Parnara mathias*, and *Baoris (Parnara) zelleri*, were also abundant during the summer and autumn. *B. zelleri* was to be found in numbers in most of the public gardens near Cairo, in September, 1916, and was found in some numbers in the larval stage on rice (*Oryza sativa*), at Teh-el-Barod, Behera province, early in the same month. The vernal brood was not taken by me either in 1916 or in 1917 at Cairo, and I have few specimens of the spring brood of *G. nostrodamus*. The abundance of goats, which crop the rather scanty grass in the winter months, and the ploughing up and clearing of agricultural land during the same period, no doubt accounts for this. But from July onwards, till November, *G. nostrodamus* and *P. mathias*, which latter species is commoner in spring than its relatives, seem to be continuously brooded. The second brood of *Baoris zelleri* first appears in the autumn, about the second week of September, and worn specimens may be taken in early November.

Hesperia (Powellia) amenophis, Rev., was to be found, though sparingly, in the desert, near Kassassin, Sharkia Province, in October, 1915, and October, 1916. In late April, 1918, I took several specimens, mostly worn, on the plateau behind the Mokattam Hills, near Cairo. It is at least a double-brooded species and may have a summer brood. It always occurs to my knowledge in association with *Convolvulus lanatus*, on which Mr. Andrès, of Cairo, has found and bred the larva. It has been taken at more than one point on or near the military railway from the Suez Canal to El Arish, and to judge from the quantity of *Convolvulus lanatus* which I saw in bloom on April 8th, near Mazar, Mehemdia (Mohamedia), and other stations on the railway, should be common in the sandy areas in N. Sinai.

I searched for *Erynnis rhamnes* at Dekehla, near Alexandria, in early May, 1918, but failed to take it, though I found its food-plant, *Phlomis floccosa*.

To turn to the Lycænids, some of my most interesting finds,

Tomares (Thestor) ballus var. *mareoticus*, *Azanus ubaldus*, and aberrations of *Virachola livia* and *Chilades trochilus* have been figured in the *Entomologist*, vol. li., p. 97, May, 1918. Some other interesting records remain to be described.

On June 10th, 1917, I took a ♂ *Polyommatus icarus*, in bad condition, on a patch of meadow in the grounds of the Gezira Sporting Club, Cairo. I had never seen *P. icarus* before in Egypt, and never heard of its capture there. True, several officers who had been quartered at Marsa Matruh, about 120 miles W. of Alexandria, have told me that "Common Blues" were to be seen there in early summer, but I have not found previous information from non-collectors to be of any value, and suspect that these "Blues" may have been *L. boeticus*. In any case the strip of steppe prolonged W. of Alexandria along the coast to Cyrenaica is scarcely to be reckoned as Egyptian from the faunistic point of view, though it is Egyptian politically. Seitz is responsible for the statement that *P. icarus* does not occur in Cyrenaica. Perhaps Dr. Verity can tell us what does occur in that faunistically and geographically little explored country.

The specimen, a ♂, of *P. icarus* taken by me at Gezira had a decidedly "southern" facies. It may have been imported with forage from Italy or Salonika, or even S. Palestine, railway communication with which was open in June, 1917, and the absence of any previous records makes me inclined to think that my specimen was an accidental visitor—an "*advena*." *Chilades trochilus* was not till May, 1917, a species which I had ever taken in abundance in Egypt, though it occurred rather locally in many places near Cairo, e.g., Maadi, near Helwan (Heluan), Marg, etc. But in late May and throughout June, 1917, I found it in large numbers on the *P. icarus* meadow at Gezira, ovipositing on the rose-purple flowers of a species of *Vicia*, from which I bred one specimen. I took a series of some 50 specimens here. They were decidedly large and well-marked. It was with regret that I found in May, 1918, that the meadow had been dug up and would be converted into a lawn tennis court.

Vicia is not the only food-plant of *C. trochilus*. In May, 1917, I found it ovipositing on *Alhagi manniferum* or *A. maurorum*, in the Wadi Rished, near Helwan, and it probably feeds on other *Leguminosae*. The pabulum of *L. boeticus* and *T. telicanus* var. *egyptiaca* is extremely varied in Egypt. I bred a number of the latter from a hedge of *Sesbania aegyptiaca*, a tall Papilionaceous shrub with yellow flowers, in the autumn of 1916. With these I also bred several *L. boeticus*, but the latter butterfly oviposited at least as much on some adjacent shrubs of *Cajulus indicus*, which the ♀ of *T. telicanus* var. *egyptiaca* did not seem to favour to the same extent, though I saw one or two instances of oviposition by the latter species on the buds of *Cajulus*. Both insects oviposit on *Alhagi* and on the red-flowered *Vicia* mentioned above. I have also seen *L. boeticus* oviposit on the following *Leguminosae*—always, so far, on the buds of flowers—"Lablab" (*Volichos lablab*), Sweet-pea, Broad Bean, Pea (*Pisum sativum*), Kidney Bean, "Lubia" Bean, and on an ornamental Leguminous shrub with large yellow flowers and prominent pistil growing in the Gezira Gardens. I further have seen *L. boeticus* oviposit on flowers of *Astragalus forskalei*, the desert food-plant of *Plebeius loewii* in Egypt, and I suspect that the young flowers of *Albizia lebbek* furnish *T. telicanus* with food-plant during the early summer.

Both these species produce in summer and autumn a certain number of dwarf specimens, generally with thin scaling and consequent pale colour. Otherwise *L. boeticus* varies but little, whether taken in the desert, the Delta, or in the Maryut Steppe. *T. telicanus* var. *egyptiaca*, in Egypt, is rare after the end of November, and remains so till April. Specimens taken during this period are sometimes of the typical form, with heavier and mouse-coloured markings on the underside, and thicker scaling, and therefore richer colour on the upperside than those which abound in the hot months. These latter are more thinly scaled above, while the underside marking is more yellowish-grey and opener, and in some cases is almost fawn colour.

I had only known of two Egyptian specimens of *Cigaritis acamas*, one taken in September on the abandoned Cairo Suez road, by Mr. E. Adair, and one taken by myself in April, 1916, on the Mokattam plateau. In late April, 1918, I took three perfect specimens of *C. acamas*, and saw others in the last mentioned locality, where *Hesperia amenophis* occurred, and near which *P. loewii* was to be found, though rarely. An expedition to the upper part of the Wadi Hof, in search of *P. loewii*, on May 5th, 1918, did not give good results. The collectors of the Entomological Section, Egyptian Ministry of Agriculture, had here taken some fine *P. loewii*, with its blue ♀ form *johannae*, Andrès, thus far only signalled from Egypt, but in 1918 the *Astragalus* plants were in poor condition, owing apparently to the attacks of a Coleophorid, and the specimens of *P. loewii* taken thereon were very small. I found *Astragalus forskalei* growing near Dekehla, early in May, 1918, on sandy grass-land near the sea. The flowers had been much eaten, but no Lepidopterous larvæ were obtained in them and a single specimen of an *Ino*, which may have been *Ino orana* was the only Lepidopteron taken thereon.

During the last two years two Pierids new to the Egyptian list have turned up near Cairo, viz., *Idmais (Teracolus) fausta* in Wadi Rished, Helwan, in early May, 1917, and *Belenois mesentina* (April, 1917), also in the desert Wadis, S.E. of Cairo. Mr. Marshall and others found *Catopsilia florella* on the move, probably migrating, in March, 1917, in the same area, and both the last named species have turned up in the western oases, Upper Egypt, where Dr. Gough and Mr. Storey of the Entomological Section, Ministry of Agriculture, have taken a good few specimens. *B. mesentina*, in May, 1918, was found in the larval and pupal stages on *Capparis*, by Mr. Storey. The comparative rarity of *Capparis* in the desert S.E. of Cairo, and Mr. Marshall's observations, convince me that his *B. mesentina* were migrants from the south. The late Lieut.-Col. Manders' record of *T. fausta*, seen but not taken in Wadi Hof, in May, was confirmed by Mr. Marshall, who in early May, 1917, took *T. fausta* and also a fine specimen of the rare *Euproctis susannae* in Wadi Rished.

A small collection of insects taken in early May, 1917, near Sollum, on the border between Egypt (or more properly Marmarica) and Cyrenaica, by a brother officer, and presented to the collection of the Ministry of Agriculture, included a small, very dark, but unfortunately damaged, specimen of *Papilio machaon*, *Pontia daphidice*, *Melitaea didyma* var. *deserticola*, and *Erynnis rhameses*. Of the other Pierids, *Pontia daphidice* and *Synchlœ glauconome* were much in evidence in the early summer of 1917. The former was quite abundant on the rail-

way embankment at Ezbet el Nakhle, on the Cairo-Marg line, where *Caylusia* sp. ? (? *canescens* or *pubescens*), a Resedaceous plant, had sprung up in considerable quantities. With it flew some worn *S. glauconome*, a species I had never previously seen in cultivated country. Both species were also noted at Gezira and Maadi, also in the neighbourhood of *Caylusia* plants. The *P. daplidice* taken in May, 1917, resembled the Constantinople summer form. Some of those taken in June approached the form *raphani*.

Mr. Storey took a very typical *P. daplidice* var. *belidice*, a form hitherto not reported from Egypt, at Dekehla, in February, 1917, as well as a single *Anthocharis crameri* (*belia*) var. *egyptiaca*. *Anthocharis belemia* was out in fair numbers in its usual haunts near Cairo, from November to February, in 1916-1917, but I failed to take any specimens of *g. aes. glauce*. But of this species I shall have more to say.

Notes on British Ectobius, Steph.

By CAPT. MALCOLM BURR, D.Sc., F.E.S.

In the *Ann. Mus. Zool. Ac. Im. Sci. of Petrograd*, vol. 21 (1916), N. Adelung discusses the genus *Ectobius*, Steph.

He begins by subdividing off a new subgenus *Ectobiella* (type *E. duskei*, Adel., from S. Russia; the female later described by Holdhaus). In this genus the female has the elytra horny and veinless as in the allied *Hololampra*. It is in fact a link between *Ectobius* and *Hololampra*.

The author briefly discusses the very distinct *E. nicaensis*, Bris. (S. France), *E. albicinctus*, Br., and *E. panzeri*, Steph. (W. Europe, including Britain), but discusses in detail *E. lapponicus*, L., *E. lividus*, Fab., and *E. vittiventris*, Costa.

British orthopterists have probably all discovered that the two former are not nearly so distinct as they would appear from their descriptions, and many are inclined to fuse them all into one. The regretted Blattist, R. Shelford, was a pronounced "lumper" in this respect.

Adelung, however, who has examined extensive material, is not inclined to agree, but gets out of the difficulty by adopting subspecies, of which he describes a number of new ones. He thus ranges *E. perspicillaris*, Herbst, (1786), with long elytra in the female and paler in colour than in the type. Then subspecies *hemiptera*, Fab., with the elytra abbreviated to a marked extent. He confines *E. lividus*, Fab., to the pale macropterous southern species, and considers all more northerly records under this name, including the British ones, to be really the *E. lapponicus* sub. sp. *perspicillaris*. Incidentally he considers *E. pallidus*, Oliv., identical with this.

Thus typical *E. lapponicus* has a monomorphic male but a dimorphic female, the form *perspicillaris*, paler, with long elytra, and *hemiptera*, Fabr., dark, with shortened elytra. All these forms are familiar to British orthopterists.

Adelung then proceeds to describe some new forms of *E. lapponicus*.

1. var. *burri*, Adel., a little smaller than the type, elytra a little shorter in the male and generally longer in the female; pronotum and elytra greyish, never reddish. Described from Delibat, Hungary.

The author then refers *passim* to the Balkan form with red prono-

tum, referred to without a name by Brunner, inadvertently referred to by Burr as "var. *erythronata*, Br." Adelung corrects this to var. *erythronata*, Burr, nec Br.

2. var. *discrepans*, Adel. Only female known; of the *hemiptera* form, the pale border of the pronotum dominating and almost extinguishing the normal dark centre. Received from Vernon, Beauchamps and Demont, in France.

3. var. *picta*, Adel., bigger than the type and coloration more ornate and complex; described from Fontainebleau and Bouray.

4. var. *chopardi*, Adel., a little smaller than type; colour pale; approaches *vittiventris*, Costa. Described from France, Fontainebleau, Bouray, St. Germain, Beausset.

Our British orthopterists would do well to pay careful attention to all available material of *E. lapponica* and so-called *E. lividus*. It seems practically certain that the name *E. lividus* should be confined to our big, pale, macropterous, Mediterranean species, our pale British form hitherto called *lividus* really being *E. lapponicus* var. *perspicillaris*. Almost certainly the *hemiptera* form is known in Britain too.

A New British Capsid (Hemiptera).

By E. A. BUTLER, B.A., B.Sc., F.E.S.

On three occasions during last August and September Mr. H. Donisthorpe captured in Surrey a species of *Capsidae*, which has not previously been recorded from Britain. Five specimens in all were taken, one ♂ four ♀s, two of them at Weybridge and the other three at Oxshott, and all occurred on Scotch Fir. These insects, though in colour varietal rather than typical, agree morphologically with the description of *Megacoelum beckeri*, Fieb., given in Reuter's great work, *Hemiptera Gymnocerata Europae*, and they represent, I feel sure, one of the many forms of that variable species, and as such, make an interesting addition to our Hemipterous fauna.

M. beckeri is very closely allied to *M. infusum*, H.S. (the well-known *Calcoris infusum* of British catalogues), and for its recognition no more is needed than to mention the points of difference. *M. infusum* is always described as glabrous on the upper surface, and this is sufficiently accurate for all practical purposes, though I find that in most specimens there are two or three long and very fine erect hairs, usually either on the disc of the pronotum, or at the apex of the corium close to the cuneus. *M. beckeri*, on the other hand, is, when in good condition abundantly supplied on its upper surface with long erect hairs, which, however, are very easily rubbed off. The hind tibiae of *M. beckeri* have also both the black setae on their outer edge and the fine hairs on their inner, evidently longer than in *M. infusum*, and there are similar long hairs on the hind margin of the posterior femora near the apex. It is also a slightly longer and more robust insect, with stouter antennae and legs. Some of Mr. Donisthorpe's specimens show the dorsal hairs remarkably well, and though others have lost many of them, they are all recognisable by the features of the hindlegs and the size and general robustness of form.

The colour of both species varies a good deal, and while the typical form of *M. beckeri* is pale, like the majority of our British examples of *M. infusum*, both species have also darker forms, and the above speci-

mens are of this dark coloration, rufo- or castaneo-testaceous, with the cuneus bright red and the hind tibiæ dark.

In the general collection at the British Museum, standing under the name *M. infusum*, there are specimens from Austria which were in Dr. Eger's collection, and still carry his labels bearing the name *M. infusum*; but as they are strongly pilose, they clearly belong to *M. beckeri*; one is pale and appears to represent the var. *lethierryi*, Fieb., of which I have seen an authentic specimen from Mr. Champion's collection, and the other is dark like the Weybridge and Oxshott examples.

Mr. Donisthorpe tells me that his captures were all made from fir trees, at the foot of which in each case there was a nest of the ant *Formica rufa*, while no specimens were found on trees not so accompanied; and he considers that, like *Pilophorus*, which occurred with it, the bug may have some sort of association with the ant. Reuter gives as the habitat of *M. beckeri*, -*Ulmus*, etc.; but what the "etc." covers nowhere appears, though it may, perhaps, include fir-trees. *M. infusum* is with us most commonly found on oaks, but it is recorded on the Continent from fir-trees also, and in the light of Dr. Eger's specimens mentioned above, the question naturally arises whether these fir-tree specimens may not, after all, have been *M. beckeri*. On the continent, *M. beckeri* occurs in France, Italy, Austria, Hungary, Rumania, Greece, and S. Russia, and it appears to be rather more southern in its distribution than *M. infusum*.

I am much indebted to Mr. Donisthorpe for kindly placing three of his captures at my disposal.

New species of *Aristotelia* and *Micropteryx*.

By the RIGHT HON. LORD WALSLINGHAM, M.A., LL.D., F.R.S.

ARISTOTELIA, Hb.

2894.1. *Aristotelia aletris*, sp. n.

Antennae distinctly annulate alternately with yellowish white and fuscous. *Palpi* whitish, the median joint with a fuscous band before the apex, broader on the outer than on the inner side; the terminal joint with a narrower fuscous band around it before the apex. *Head* and *Thorax* mealy whitish, dusted with fuscous. *Forewings* mealy whitish, profusely dusted with fuscous, except on a terminal band wide on the costa, curved and narrowed to the tornus where it ends in a fuscous spot; there is a pale yellow outwardly curved fascia on the basal fourth widening toward the dorsum, a pale yellow patch at the middle of the dorsum rising to a little above the fold, and another pale yellow patch above the fuscous tornal spot, rising toward the costa at the end of the cell, but not reaching it; cilia mealy white, profusely dusted with fuscous, except at their outer extremities about the tornus. *Exp. al.* 6.5mm. *Hindwings* and cilia shining steel-grey. *Abdomen* fuscous above, whitish beneath. *Legs* whitish, speckled with fuscous at the joints.

Type ♀ (95976). Mus. Wlsm. B.M.

Hab. SICILY: Syracuse, 26, iv., 1918 (Wlsm.). Unique.

Allied to *eppelsheimi*, Stgr., but smaller and much less brightly coloured, moreover, the bright yellow fascia in *eppelsheimi* is straight,

not curved outward as in *aletris* where it bends inward nearly to the tornus.

MICROPTERYX, Hb.

4776-1. *Micropteryx corcyrella*, sp. n.

Antennae fuscous. *Palpi* shining steel-grey. *Head* ochreous. *Thorax* purplish fuscous. *Forewings* shining aeneous, with a purplish tinge along the costa and around the termen; with two bright silvery fasciae, the first at one-fifth of the wing-length, the second about the middle, tending very obliquely outward from costa to dorsum—each of these two fasciae is about half as wide as the space between them; beyond the outer fascia, half-way to the apex, is an inverted shining silvery patch, at least as wide as the fasciae themselves, and reaching about half across the wing; cilia bronzy-grey, with a slight purplish sheen along their base. *Exp.al.* 6.5mm. *Hindwings* shining bronzy, darker than the aeneous forewings; cilia bronzy-grey. *Abdomen* and *Legs* shining bronzy; ♂ genitalia strongly developed.

Type ♂ (85380), Mus. Wlsm. **B.M.**

Hab. CORFU: Palaeocastrizza, 1872 (Wlsm.) Three specimens (all ♂s).

Allied to *berytella*, Joann., but differing in the absence of a dorsal spot beyond the middle and of the costal spot before the apex, nor is there any costal spot between the fasciae, moreover, the fasciae are broader and more conspicuous.

4778-2. *Micropteryx ertella*, sp. n.

Antennae fuscous. *Palpi* shining pale aeneous. *Head* pale aeneous. *Thorax* aeneous; tegulae bright purple, which colour, however, does not extend to the base of the forewings as in *calthella*, L. *Forewings* shining aeneous, with an oblong silvery white costal spot at one-fifth from the base, not reaching beyond the upper edge of the cell, its extension lateral, not perpendicular: an outwardly curved, almost angulate, silvery fascia at about the middle reaches the dorsum at a point further removed from the base than its origin on the costa; pointing inward toward the middle of this fascia is a broader silvery costal patch, extending over half the breadth of the wing—these are the only markings in the ♂, and they occur also in the ♀, thus differing from *aruncella*, Scp.—the curved fascia separates it from *eximiella*, Z.; cilia pale fuscous with a brassy sheen. *Exp.al.* ♂ 7mm., ♀ 6mm. *Hindwings* pale fuscous with brassy sheen; cilia the same, but duller (more purplish) toward the wing-base. *Abdomen* fuscous above, shining steel-grey beneath. *Legs*, hind tibiae fuscous, tarsi paler.

Type ♂ (); ♀ (). Mus. Wlsm. **B.M.**

Hab. SICILY: Monte Pellegrino, Palermo, 13-23, iii., 1918 (Wlsm.). Ten specimens (8 ♂s, 2 ♀s).

The ancient Latin name of Monte Pellegrino was *Erecta*.

4778-3. *Micropteryx uxoria*, sp. n.

Antennae fuscous. *Palpi* cinereous. *Head* clothed with yellowish hair-scales. *Thorax* bronzy; tegulae rich purple. *Forewings* greenish brassy, with two complete silvery fasciae and an inverted costal patch; the first fascia straight, at about one-fifth from the base; the second fascia, leaving the costa at about the middle, is sometimes slightly

convex, but usually straight and diverging a little toward the dorsum, which it reaches scarcely beyond the middle; the costal patch, equidistant between the second fascia and the apex, is inverted, and reaches half across the wing—these markings are conspicuous and of uniform width; cilia shining bronzy-grey. *Exp. al.* ♂ 7-8mm., ♀ 8-9mm. *Hindwings* shining bronzy; cilia bronzy-grey. *Abdomen* greyish fuscous; genital segments of ♂ strongly developed. *Legs* pale greyish fuscous.

Type ♂ (95987), ♀ (95988). Mus. Wlsm. B.M.

Hab. SICILY: Taormina, 1-3, v., 1918 (*Wlsm.*). Eight specimens (5 ♂ s, 3 ♀ s).

In the ♀ the markings are precisely similar, but there is a slight silvery sheen at the extreme base of the dorsum; in neither sex is there any purplish colour at the base.

I have carefully compared these specimens with four in the Zeller Collection and one in the Stainton Collection—all original specimens of *eximiella*, Z., received from Mann and labelled "*Etrur.*" The average size of my species is certainly larger; I was at first inclined to regard them as that species, especially as Chrétien [*Le Naturaliste* 30 (2s. 2) 60 (1908)] has stated that the ♀ of *eximiella* has the same silvery bands and costal spots as the ♂, thus separating it at once from *aruncella*, Scp., and *seppella*, F., but it must be remembered that this discovery refers to specimens taken at Digne, which may possibly have been wrongly identified. I have a ♀ (81721) from Rome (iv., 1893, *Wlsm.*) which has no markings, but it was taken there at the same time as *eximiella* ♂, and is certainly smaller than *calthella*, L., and has no violet at the base of the forewings.

The Sicilian specimens differ from the Tuscan, as well as from Zeller's description, in the following points: first, there is no violet tinge at the base of the forewings in the ♂; secondly, no reddish tinge along the costa; and thirdly, it is observable in all the specimens of *eximiella* that the first fascia stops slightly before reaching the costa, whereas in *uxoria* it distinctly reaches it in all instances.

SCIENTIFIC NOTES AND OBSERVATIONS.

FOOD-PLANT, AND REARING, OF *HYDROECIA CRINANENSIS*.—A few days since I received from Mr. L. A. E. Sabine thirteen magnificent bred specimens of a *Hydroecia*, which he suggested were probably *H. crinanensis*. Having examined the genitalia I found that his guess was correct. In response to my request he has kindly supplied me with the following details of his discovery, which, with his consent, I now publish, as far as possible (because of space limitation), in his own words:—

"On June 22nd this year I noticed a plant of 'Yellow Flag' (*Iris pseudacoris*) which had the central leaf of one of its main shoots slightly withered. I, of course, investigated, and found that a larva had been feeding in the stem, but had departed. I thereupon decided to make a thorough search for other affected plants, and after examining a few more was rewarded by discovering a larva about two-thirds grown. After an afternoon's hard working I had seventeen larvæ, varying in size from half to full grown, but only two of the larger size. In every case the larva was found feeding in the shoots which

did not contain a flowering stem, and not one was discovered in the roots, although occasionally when the stem was rather short the larva ate the central portion down as far as the crown of the root, no further. The larvæ were frequently found in the upper part of large shoots, a foot or more above the ground.

"The locality was low-lying and damp, with a very small stream of water, near an area of bog, and on the borders of a wood. During the remainder of the month other larvæ were found in the same plant in similar localities, all damp and low-lying, and no doubt sometimes flooded in winter. Just a few larvæ were also discovered in *Iris* stems growing on the extreme edge of a salt marsh, which was, I was informed, often flooded during the winter months, but I doubt whether the salt water would actually reach the plants in which the larvæ were found, although it would seem quite possible. In this latter place, and in others near the coast, larvæ of *H. micacea* were found in the roots of *Iris* on July 16th and onwards, the larvæ of this species being always in some portion of the roots, and eating only so far as the base of the shoots.

"I ought not to attempt to describe the larvæ of *H. crinanensis*, as I have no notes of my observations. But I remember that it was of a dirty-white colour, with some longitudinal stripes of a pale pinkish, or flesh-colour, which became less pronounced when the larva became full grown. There were also black dots on the segments. Several of the larvæ were 'stung.'

"I experienced no difficulty in feeding the larvæ. I cut fine, healthy shoots of *Iris*, with a fair portion of root attached, in order that they should remain fresh as long as possible. I then cut off the ends of the shoots and formed a hollow in the centre. I placed the head of the larva towards this hollow, at the same time making him very uncomfortable by tickling his tail. He immediately made for the hollow, and satisfying himself that it was his proper food-plant, at once settled down and made himself at home. It was not even necessary to change the stems, as I placed only one larva in each, and there he remained until full-fed.

"When full grown the larvæ leave the stems and pupate in earth. I lost a number at this period, as they burrowed about a good deal in the earth, and those which had already formed their cocoons were often disturbed by later arrivals. This naturally often ends in malformed pupæ and death. I was rather surprised at this as I gave them plenty of earth and they were not overcrowded.

"The imagines emerged from July 31st to August 10th, and show an interesting amount of variation of colour."

Mr. Sabine also kindly sent me further specimens of *H. crinanensis*, taken in another locality in 1914, on "Ragwort" flowers, "on the lower slopes of a limestone mountain, the nearest fresh water being about a mile away." This does not militate against the conclusions drawn from all former experiences that this species is always connected with fresh-water streams. These examples may have flown to the higher ground.

Mr. Sabine's discovery is an interesting one. Our previous idea, that the food-plant of *H. crinanensis* might be Scabious or some other stream frequenting plant, is finally answered. It is for friends who have found the insects to confirm the observation by stating whether *Iris* occurs in the localities where it occurred.

Mr. Sabine tells me that he did not see any *H. nictitans*, *H. paludis* or *H. lucens* in the locality where the larvæ were found—Ballysodare, Co. Sligo. Ireland is once more found to be a favourite home of this species. Mr. Sabine promises, all being well, to obtain larvæ for description next season. This will be as it should be. Have the larvæ of *H. nictitans*, *H. lucens*, and *H. paludis* ever been described?

Mr. T. Greer, of Stewartstown, Co. Tyrone, writes me. He has taken numbers of specimens. "*H. crinanensis* must have some other food-plant besides Iris; as in many localities here this plant is absent where the insect occurs. Coarse grass and thistles are there in quantity and I surmise that it will be found to feed internally in these plants also."—(Rev.) C. R. N. BURROWS, Mucking, Essex.

NOTES ON COLLECTING, Etc.

FIELD NOTES FROM BATH.—On May 31st, 1918, the Rev. A. M. Downes took me to one of his favourite localities, but it did not produce much in the way of Micros. He found *Agriades thetis* and *Polyommatus icarus* common among the long grass, and took also *Cupido minimus*, which was new to him in that locality. Early in June *Enarmonia* (*Semasia*) *woeberiana* was emerging from pupæ from the bark of an old *Pyrus aucuparia* in Victoria Park, and I took one very dark ♀. On the 8th of this month *Blastotere glabrattella* was still on the wing at Bathford. (I have now been able to compare my specimens and to identify them as this species.) The common *Epinotia* (*Catoptria*) *hypericana* also occurred, though I did not see it last year, the same may be said of *Cacoecia* (*Cnephasia*) *musculana* and *Epiblema* (*Paedisca*) *bilunana*. On the 13th *Drepana falcataria* was seen at rest at Bathampton, and on the 15th three *Bryophila perla* were noted on the walls. This seems an early date. On the 23rd, *Acala* (*Peronea*) *logiana* emerged, and another the next day, from pupæ previously gathered. The moths of the summer brood appear to be much less numerous than those of the autumn brood. At the time I was glad to take a few specimens of *Ephestia calidella* (*ficella*) at the grocer's shop, and also to discover the headquarters of the ♂s of *Tortrix* (*Sphale-roptera*) *longana* in an old quarry. The ♀s occurred in various places but the ♂s only in this one spot. They were resting on the taller bits of the herbage, and were very quick on the wing when disturbed. From a pupa spun up in the shoot of a Scot's pine I bred *Evetria* (*Retinia*) *buoli-ana*, and from a pupa between ivy leaves the nearly black var. of *Cacoecia* (*Tortrix*) *podana* ab. *sauberiana*. There is certainly a tendency towards melanochroism among the Lepidoptera of this district. I noticed one *Lithocolletis cramerella* nearly as dusky as those from the North of England and Scotland, and have already mentioned several dark specimens of other species that I met with. The tendency may be due to the damper air of the west. I did not find moths so abundant in 1917 as in the previous year, except perhaps *Eucosma* (*Penthina*) *variegana*, which I think was more common. I spent some time getting series of the common "Sciaphilas," which were abundant.

The Phycitids mentioned (vol. xxix., p. 169) as rolling the leaves of Turkey Oak into balls, produced the common *Acrobasis* (*Rhodophaea*) *consociella*, and the larger species taken later was *A. (R.) zelleri* (*tumidella*). I also mentioned some saw-fly larvæ in a web on hawthorn,

but I believe now that they were the larvæ of *Eurhodope* (*Rhodophaea*) *suavella*. It was getting dark, and I was in a great hurry, when I came across them. Among other species which have not been mentioned I found *Tortrix* (*Aphelia*) *osseana* common among rough herbage at Bathford, *Epiblema* (*Ephippiphora*) *trigeminana* among ragwort, *Epermenia* (*Chaulioidus*) *chaerophylllella*, one specimen at Combe Down. The mines of *Lithocolletis lantanella* were abundant in the *viburnum* bushes, in some of the lanes. This will I think conclude my notes from Bath, as I left the city on July 3rd.—ALFRED SICH. December 5th, 1918.

SOME ACULEATE HYMENOPTERA FROM LEICESTERSHIRE IN 1918.—Leicestershire naturalists may be interested in these notes on a year's casual collecting of bees and wasps in that county, since it is one of the shires to which practically no attention has been paid by Hymenopterists.

It has been a poor year for Aculeates here; the sallow bloomed in wet weather and, although there was a fine show of *Senecio* in the autumn, it did not bring me a single bee. I had very few captures in August and practically none afterwards.

The most productive localities were (a) Market Bosworth, (b) Peckleton Common, (c) Swithland Wood, (d) Great Glen and (e) Bransford Bridge, near Lutterworth. To these must be added (f) the Outwoods, Atherstone, just over the county border in Warwickshire. My collecting was largely limited to these places and was intermittent on account of military duties; the list is therefore in no way representative; but, since it adds somewhat to the records for Leicestershire, it may be worth publication. It is worthy of notice that many species recorded by Mr. Morice for Rugby occur also in Leicestershire, while several of the rarer captures have already been recorded for this county in Mr. Bouskell's list in the *Victoria History of Leicestershire*.

In the following list the letters after each species indicate the localities named above, and those marked * are included in Mr. Bouskell's list. The nomenclature is that followed by the late Mr. Saunders, whose kindness to me some years ago I shall always bear in remembrance.

Myrmosa melanocephala, Fab. c; *Sapyga 5-punctata*, Fab. a; *Pompilus minutulus*, Dahl. d; *Salix exaltatus*, Fab., c, d; *S. parvulus*, Dahl., b; *Agonia variegata*, L., c; *Tachytes pectinipes*, L., f; *Trypoxylon figulus*, L., a, d, c; * *T. clavicernum*, Lep., c, d; *T. attenuatum*, Sm., a; *Pemphredon lugubris*, Latr., b, d; *P. shuckardi*, Moraw., a; *P. lethifer*, Shuck., a; *P. morio*, V. Lind. d; *Diodontus tristis*, V. Lind. a; *Passaloecus insignis*, V. Lind. a, d; *Psen pallipes*, Pz., a, d; * *Gorytes mystaceus*, L., d; *Oxybelus uniglumis*, L., a, b; *Crabro clavipes*, L., a; c, d; * *C. leucostomus*, L., a, d; *C. capitosus*, Shuck., a; *C. podagricus*, V. Lind. c, d; *C. varius*, Lep., a, b, f; *C. elongatulus*, V. Lind. d, e, f; *C. 4-maculatus*, Dhl., b; * *C. dimidiatus*, Fab., a, c, d, f; *C. chrysostomus*, Lep., a, b, d, f; *C. cribrarius*, L., b; * *C. interruptus*, De G., a; *C. albilabris*, Fab., f; * *Vespa vulgaris*, L., a; * *V. germanica*, Fab., a, d; * *V. rufa*, L., a, b, d; * *V. sylvestris*, Scop., a, d; * *V. norvegica*, Fab., c; * *Odynerus spinipes*, L., a, f; * *O. callosus*, Thoms. a, c; * *O. parietum*, L., a; *O. pictus*, Curt., a, b, e, f; *O. 3-marginatus*, Zett.,

a, f; *O. 3-fasciatus*, Oliv., a, b, c, d; * *O. parietinus*, L., a, b, d, f; *O. sinuatus*, Fab., c, d.

Colletes daviesana, Sm., a, c; **Prosopis communis*, Nyl., a, d; *P. hyalinata*, Sm., a; *P. brevicornis*, Nyl., a; *Sphecodes gibbus*, L., c; *S. subquadratus*, Sm., c, f; *S. affinis*, v. Hag., b, c; **Halictus rubicundus*, Chris., a, b, c, d, f; **H. cylindricus*, Fab., b, c, d, e, f; *H. albipes*, Kirb.; *H. paucillius*, Schenck, e; *H. punctatissimus*, Schenck, f; *H. nitidiusculus*, Kirb., a, f; **H. tumulorum*, L., b, f; *H. smeathmanellus*, Kirb., a; *H. morio*, Fab., a, b, c, f; *H. leucopus*, Kirb., a, c; **Andrena albicans*, Kirb., a, c; **A. rosea* var. *trimmerana*, Kirb., a, c; *A. nitida*, Fourc., a; **A. fulva*, Sch., a; **A. clarkella*, Kirb., a, b, c; *A. nigroaenea*, Kirb., a; **A. gwynana*, Kirb., a, c, d; **A. praecox*, Scop., c; **A. cingulata*, Fab., e, f; **A. chrysosceles*, Kirb., a; *A. humilis*, Imhoff, f; *A. nana*, Kirb., a, c, d; *A. dorsata*, Kirb., b, c; *A. wilkella*, Kirb., b, f; *Nomada roberjeotiana*, Pz., c; **N. succincta*, Pz., a, b, c, f; **N. alternata*, Kirb., a, c, e, f; *N. lathburiana*, Kirb., f; **N. ruficornis*, L., e, f; *N. bifida*, Thoms., a, b, c, f; **N. ochrostoma*, Kirb., b, f; **N. fabriciana*, L., f; **Chelostoma florissomne*, L., a, d, f; *Coelioxys 4-dentata*, L., a; *C. rufescens*, Lep., d; *C. elongata*, Lep., a; *C. acuminata*, Nyl., a; *Megachile willughbiella*, Kirb., d, e.; **M. circumcincta*, Lep., f; *M. ligniseca*, Kirb., d; **M. centumcularis*, L., a, d; **Osmia rufa*, L., a, c; *O. xanthomelana*, Kirb., f; *O. caeruleus*, L., a, f; *O. fulviventris*, Pz., a, f; *O. spinulosa*, Kirb., d; *Anthidium manicatum*, L., d; **Melecta armata*, Pz., a, c; **Anthophora pilipes*, Fab., a; *A. furcata*, Pz., a, d; **Psithyrus rupestris*, Fab., d; **P. vestalis*, Fourc., a, c; **P. barbutellus*, Kirb., a, d; **P. campestris*, Pz., d; **P. quadricolor*, Lep., a; **Bombus venustus*, Sm., a, b, c, d; **B. agrorum*, Fab., a, c, d; **B. hortorum*, L., a, c; **B. sylvarum*, L., a; **B. derhamellus*, Kirb., a, d; **B. lapidarius*, L., f; **B. pratorum*, L., a, d, f; **B. terrestris*, L., a, c; *B. terrestris* var. *virginalis*, Kirb., a.—LIEUT. L. A. BOX, Great Glen, Leicester. November 16th, 1918.

ABRAXAS GROSSULARIATA VAR. EXQUISITA.—Referring to the supposed new form of *Abraxas grossulariata*, which the Rev. G. H. Raynor proposes to name ab. *exquisita* (*Ent. Rec.*, vol. xxx., p. 189), the description he applies to it agrees exactly with a form which we have been breeding here for over a dozen years, and which we have always regarded as an extreme form of the male of ab. *varleyata*. My oldest specimen, bred from a wild larva, is dated "Huddersfield, bred 1905," and my most recent one, a beautiful second brood example, "Huddersfield, bred November 2nd, 1918." In my big series of *varleyata*, I have specimens showing every gradation, so far as the large marginal cuneate white blotches are concerned, from this extreme form to the most ordinary form of the male, and beyond it to many males which show no trace of any cuneate mark at all. But we have always regarded these cuneate marks as sexual, as it is very rarely indeed that they show in the females at all. I have only seven specimens (and have never bred or seen more than one or two more) in my series which do so, and they with not more than two (sometimes only one) in each hindwing, and none in the forewings. But my friend, Mr. Raynor, tells me that all his five specimens are females, which fact certainly is as new as it is extraordinary in this extreme form. The numerous and large cuneate marks undoubtedly give the variety an

exquisite appearance, but anyone who knows how very variable in the number, size, and shape of its white marks *ab. varleyata* is, would see at a glance that Mr. Raynor's *exquisita* is nothing more than a form of it, and as such it has no more claim to have another varietal name given to it, than have dozens of the many other forms of the variety, and which to name differently would be absurd.—GEO. T. PORRITT, Elm Lea, Dalton, Huddersfield. December 30th, 1918.

CURRENT NOTES AND SHORT NOTICES.

In the annals of the Caucasus Museum (our copy of the reprint unfortunately not giving reference), probably late in 1916 or early in 1917, N. Adelung describes a new species of *Gampsocleis*, *G. shelkovnikovae*, discovered by Captain Burr at Géok Tapa, in the Transcaucasus, in July, 1915. This is an interesting species. Unlike all but one of its congeners, which are mottled and usually brown, this handsome species is uniform green, and closely resembles the ubiquitous *Locusta viridissima*, for which it was for some time mistaken. It may, however, be distinguished at once in the field by its characteristic Decticine note, and by the fact that it stridulates during the heat of the afternoon, leaving off at dusk, just when the chorus of *Locusta* strikes up. It is closely related to the scarce *G. ussuriensis*, Adel., from the distant River Ussur, near Vladivostok, familiar now from the military operations being conducted there. Both are big, all green species, but in the Caucasian one the subgenital lamina of the male is longer and narrower, more strongly keeled in the centre, and more obtusely excised posteriorly; there are also other slight differences. It has since been recognised from several other localities in the Caucasus, on both sides of the main range. Adelung concludes with a note on the nine species of *Gampsocleis* known in Russia. (Only two are known in Europe outside Russia, e.g., *G. abbreviatus*, Br., from Macedonia, and the handsome *G. glabra*, sporadically occurring as far west as Belgium.) These are (1) *G. glabra*, Herbst., the type of the genus, throughout south-central Russia as far as Semirechinsk; (1a) *G. podolica*, Shug., from Podolia; (2) *G. spinulosa*, Krauss, from the upper Hoang-Ho, and in the Governments of Irkutsk and Yeniseisk; (3) *G. kraussi*, Adel., from Siberia; (4) *G. sovinskyi*, Adel., from Siberia; (5) *G. caudata*, Adel., from Yakutsk; (6) *G. christinichi*, Adel., from near Vladivostok; (7) *G. ussuriensis*, Adel., from the same neighbourhood; (8) *G. sp.*, from an unknown locality; and (9) *G. shelkovnikovae*, from the Caucasus. Uvaroff has already sunk *G. annae*, Shug., in the first named species. As Russian specimens of *G. glabra* are paler and have a longer ovipositor than those from Western Europe generally, time may show that it is a distinct sub-species, like the handsome Spanish form.—M.B.

The Russian scientific expedition to Persian Kurdistan referred to previously in these notes was a great success. The party left Tiflis on May 3rd, 1916, returning on July 11th, after visiting Tabriz, Maragi, Urmi, Salmasta, and Khoja, and a few other inhabited islands in the Lake of Urmi. In spite of the disappointing incapacity of the botanist, and the accident to Smirnoff the zoologist, who broke his leg early in the journey and had to return to Tiflis, the expedition was a great success. About 8,000 specimens of insects were taken. It was early for Orthoptera, but a fine series of the interesting genus *Nocarodes* was

brought home and some striking *Callimeneus*, probably the handsome green and cream *C. fernandezi*, Bol. The whole material, zoological, botanical, and geological is the property of the Caucasus Museum, Tiflis; the funds were supplied by the generosity of General Yanushkevich, formerly Chief of Staff to the Grand Duke Nikolas. The material was being handed over to specialists when the tragedy of the Revolution cut our Russian colleagues off from contact with humanity. —M.B.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

June 13th.—Prof. F. A. Dixey, M.A., M.D., F.R.S., was elected an honorary member.

The evening was mainly devoted to an exhibition of living specimens of Natural History.

Mr. Ashdown exhibited living larvæ of *Anatis ocellata* (Col.), and living imagines of *Rhagium inquisitor* (Col.).

Mr. R. Adkin, winter "nests" and living larvæ of *Euproctis similis* (*auriflua*) and of *E. chrysorrhæa*, the one solitary in hibernation, the other gregarious; and also living *Scoparia dubitalis* and its white form to show the *Depressaria*-like attitude of the latter.

Mr. H. Main, various early stages of *Chrysomela graminis* on Tansy, of *Timarcha violaceo-nigra* on Wood-ruff, of *Timarcha tenebricosa*, of *Necrophorus mortuorum* (all Col.), of *Gastrophilus equi* (Dip.), of *Podisus luridus* (Hem.), of *Pseudoterpna pruinata* and *Coleophora genistæ* on Petty-whin, and of *Dasychira pudibunda*.

Mr. Dennis, living larvæ of *Dicranura vinula* feeding on aspen, and stereoscopic slides.

Mr. K. G. Blair, various early stages of the Mosquitoes, *Anopheles maculipennis*, *A. bifurcatus*, and *Culex pipiens*, of the wasp *Odynerus spinipes*, of the beetles *Lema melanopa*, and the two sexes of *Ptilinus pectinicornis*, and on behalf of Mr. F. W. Champion the rare beetle *Gnorimus nobilis*, from Ealing.

Mr. Bunnett, a flower of *Anemone nemorosa*, in which the sepals were leaf-like, with photographs of the palmate newt and of the cristate newt, and a common lizard, which had reproduced its tail which had originally been broken off.

Mr. H. Moore, a living *Argiades sylvanus*, and seasonal forms of the American *Papilio marcellus* (*ajax*), the spring form, and form *telamonides*, the late spring form, a transition to *lecontei* (*marcellus*), the summer form.

Mr. Hy. J. Turner, a melanic specimen of *Alsophila aescularia* from Mansfield, and *Pyramis atalanta*, with pale red bands, from Cornwall and Ireland.

Mr. F. W. Frohawk, the rare *Trichius fasciatus* (Col.), from S. Wales, a male *Euvanessa antiopa*, from N. Britain, a series of female *Pieris brassicae*, showing gradation in the development of a band on the fore-wings, one example having a black spot on the hind-wing.

Mr. Lachlan Gibb, the very rare yellow form of *Pieris rapæ*, from Canada.

Mr. Neave, a partially banded *Pieris brassicae*, bred from Nasturtium.

Mr. Simms, larvæ of *Ruralis betulae* and *Strymon pruni*.

Mr. Edwards, a *Calosoma sycophanta*, from Epping Forest.

June 27th.—A CURIOUS RESEMBLANCE.—Mr. Main exhibited the stalked seeds of *Geranium robertianum* attached to leaves, etc., near the ground and much resembling ova of insect species.

A REMARKABLE EMERGENCE.—Mr. Moore, for Mr. Cooke, living *Tortrix viridana*, which had emerged from a mass of pupæ taken from the throat and stomach of a dead jay.

A RARE COLEOPTERON FORM, ETC.—Mr. Priske, the rare blue form of the beetle *Calosoma inquisitor*, the egg-mass of the water beetle *Hydrophilus piceus* beneath a *Potamogeton* leaf and pointed out the "mast," and specimens of *Helix aspera* and *H. nemoralis*, with their summer epiphragms, each having an opaque spot.

ABERRATIONS OF *H. MALVAE* AND *P. ICARUS*.—Mr. Neave, an extremely pale brown form of *Hesperia malvae*, and an example of *Polyommatus icarus* ab. *icarinus*.

ABERRATIONS OF *A. THETIS*.—Mr. Sperring, aberrations of underside *Agriades thetis*, from Cuxton, one with unusually dark and well-developed submarginal spots, another with somewhat sagittate spots, and another deficient in the basal spots.

RESTING POSITION OF MALE *P. AVERSATA*.—Mr. Main, noted that *Ptychopoda (Acidalia) aversata* male rested on the four front legs with the hind legs extended backwards.

STEREOGRAPHIC SLIDES SHOWN.—Mr. Dennis, stereographic slides of the milkwort and the quaking grass.

Mr. Turner, for Dr. Chapman, a larva of the W. American *Orygia*, *O. vetusta*, from California.

AN ABERRATION OF *L. ARION*.—Mr. B. W. Adkin, for Mr. E. B. Kershaw, an example of *Lycæna arion*, with all markings absent except the discoidal spot and the marginal spots, also a specimen of the Hongkong butterfly *Clerome eumeus*, belonging to the *Morphinae*.

EXHIBITION AND DISCUSSION OF *E. ATOMARIA*.—The rest of the evening was devoted to the exhibition and discussion of *Ematurga atomaria*.

Mr. Adkin exhibited series from many parts of the British Isles, including a unicolorous dark brown male from Epping Forest, and the Lancashire dark form.

Mr. B. W. Adkin, races from many southern localities, and a blackish-brown race from Durham.

Mr. Ashdown, series from Surrey with the yellow Swiss form for comparison.

Mr. Leeds, series from the Midlands, one having a bright yellow ground.

Mr. Barnett, pale examples from the Fens, and various series from the Surrey hills.

Mr. H. J. Turner, British forms, and a series from various places in France, Italy, Switzerland and Germany, showing the strong sexual divergence in colour in the former series and the strong sexual convergence in colour in the latter continental series. He then read a paper dealing with the named forms, and summarising the lines of variation.

July 11th.—SURREY LEPIDOPTERA EXHIBITED.—Mr. Ashdown exhibited numerous species of Lepidoptera taken or bred by him in Surrey this season, including *Cabera pusaria* ab. *rotundaria*, *Amphidasis betularia* with var. *doubledayaria* and intermediates, *Tricopteryx viretata*, *T. carpinata*, *Acronicta leporina*, etc.

NEW FOREST COLEOPTERA AND VARIATION IN *ELATER SANGUINOLENTA*.—Mr. W. West, Coleoptera taken by him recently in the New Forest, including a fine series of *Elater sanguinolenta*, which had been abundant, with extreme aberration of the dark marking, and seven yellow forms. He also showed *E. lythopterus*, *E. miniatus*, *Cryptocephalus lineola*, and the parasitic beetle *Tomoxia biguttata*.

STEREOSCOPIC SLIDES SHOWN.—Mr. Dennis, stereoscopic slides of *Orchis maculata* and of *Juncus obtusifolius*.

AN EXAMPLE OF MIMICRY. A RARE *EUPLOEA* SHOWN.—Mr. Edwards, *Euploea depuisei* var. *lykeia* from the Tailaut Isles, Malay, and the Danaine *Lycorea halias* and its mimic the Arctiid *Pericopsis angulosa* from Venezuela.

A LOCAL CAPTURE.—Mr. Sich, an *Ephestia* taken in the room.

THE RARE COLEOPTERON *GNORIMUS NOBILIS*.—Mr. Lachlan Gibb, specimens of the rare beetle *Gnorimus nobilis* from Hereford.

Mr. Priske, the same species from Chiswick.

A PAPER.—Mr. Sich read a paper, "A Beginner's Remarks on the Tortricina."

July 25th.—SURREY COLEOPTERA, 1918.—Mr. Ashdown exhibited aberrations of *Leptura maculata* (*armata*), a fine graduated series, also *Clythra 4-punctata*, *Chrysomela orichalcea* (♂ and ♀), and *Ctesias* (*Tiresias*) *serra*, all from Surrey.

BRED TORTRICES.—Mr. Barnett, a bred series of *Ephippiphora scutularana* from Epping Forest, and its Hymenopterous parasite; a bred series of *Cydia pomonella*; and blue females of *Polyommatus icarus*.

NEW FOREST COLEOPTERA.—Mr. West, Coleoptera taken in the New Forest in June, *Leptura scutellata*, *Hypera rumicis*, *Luperus nigrofasciatus*, *Ceuthorrhynchus chrysanthemi*, and *Cleonus nebulosus*.

ABERRATION OF *L. ARION*.—Mr. B. Adkin, a photograph of the underside of the specimen of *Lycæna arion* with obsolete marking, previously exhibited.

PROTECTIVE COLORATION IN *A. BETULARIA* LARVÆ.—Mr. Mera, living larvæ of *Amphidasis betularia*. Brood A (1) on sallow and A (2) on beech. Brood B (1) on sallow, B (2) on blackthorn. In both broods those on sallow were green in colour, those on beech were dark, and on blackthorn very dark. The decision of colour occurred only in the very early stage.

ABERRATION OF *D. VINULA*.—Mr. Bunnett, *Dicranura vinula* in which the hindwings were unusually hyaline, and a *Toxocampa pastinum* from Coulsdon.

FLORIDA BUTTERFLIES AND THEIR GEOGRAPHICAL DISTRIBUTION.—Mr. Moore, butterflies from Florida, including *Heliconius charitonius*, *Thecla acis*, *Lycaena hamo*, *Papilio cresphontes*, *Anosia berenice*, *Dione vanillae*, *Junonia coenia*, *Limenitis floridensis*, *L. disippus*, *Pyrameis atalanta*, etc., and discussed the distribution of the various species.

A PAPER: VARIATION IN *L. QUADRIPUNCTELLA*.—Mr. A. Sich read a paper discussing the aberration of *Lampronia quadripunctella* and naming two recurrent forms.

ECONOMIC ENTOMOLOGY ILLUSTRATED.—Mr. Edwards discussed the devastation caused by *Phylloxera vastatrix* to the vine, *Hylesinus piniperda* to the pine, and *Doryphora decemlineata* to the potato, illustrating his remarks with a series of large diagrams.

The Back volumes (I-XXX) of the *Ent. Record*, &c. (published at 10s. 6d. net), can be obtained direct as follows—Single volumes, 7s. 6d., except vols. I. and II., which are 10s. 6d. each; of the remainder 2 or 3 volumes, 7s. 3d. each; 4, 5, 6, 7, 8 or 9 vols., 7s. each; 10, 11, 12, 13 or 14 vols. at 6s. 9d. each; 15, or more vols. at 6s. 6d. each. Back copies of the Magazine at double the published price (plus postage). Special Indexes to Vols. III-XXX, sold separately, price 1s. 6d. each.

Subscriptions for Vol. XXXI. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 [This subscription includes all numbers published from January 15th to December 15th, 1919.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Ten Shillings, and must be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 Cheques and Postal Orders should be made payable to H. E. PAGE.

ADVERTISEMENTS of Books and Insects for Sale, or Books wanted will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14

Subscribers who change their addresses must report the same to Mr. H. E. PAGE "Bertrose," Gellatly Road, New Cross, London, S.E.; otherwise their magazines will probably be delayed.

Articles that require illustration are inserted on condition that the author defrays the cost of the illustrations.

All Foreign Exchange Magazines must be forwarded to H. J. TURNER 98 Drakefell Road, New Cross, S.E. 14

Duplicates.—*T. pruni* (fair types), *Pisi* (bred), *Lucipara* (bred), pupæ of *Janestris*. *Desiderata*.—Very numerous to renew and extend.—*Wm. Foddy*, 39, York Street, Rugby.

Duplicates.—**Dissimilis*, *Velleda*, *Fibrosa*, **Ambigua*, *Fulva*, **Lubricipeda* var. *Fasciata*, **Plantaginis*, *Coracina*, *Captiuncula*, *Mundana*, *Lutosa*, *Togata*, **Valerianata*, *Ciliialis*, *Inquinateilus*, *Caledoniana*, *Variegana* vars. *Sauciana*, *Geminana*, *Cinerana*, *Brunnichiana*, *Schulziana*, *Congelatella*, *Occultana*, *Vectisana*, *Dorsana*, *Rusticana*, **Suboccelana*, **Strobilella*, *Nanana*, *Herbosana*, *Petiverella*, *T. corticella*, **Ecop*, *Fulvigitella*, etc. *Desiderata*.—Good *Pyrales*, *Tortrices*, etc.—*T. Ashton* Lofthouse, The Croft, Linthorpe, Middlesbrough.

Desiderata.—*Pieris napi*—spring and summer broods with exact data (localities and dates)—from all parts of the Kingdom, especially North of England and Scotland; *Pararge ægeria* from Scotland, Ireland, and North of England—exact data needed. Will do my best in return or pay cash.—*G. T. Bethune-Baker*, 19, Clarendon Road, Edgbaston.

Duplicates.—*Varleyata* and other varieties of *Grossulariata*. *Desiderata*.—Good varieties and local forms. *Spilosoma urticae*, *Advenaria*, and other ordinary species to renew old series. Good *Tortrices* and *Tineae*.—*Geo. T. Porritt*, Elm Lea, Dalton, Huddersfield.

Duplicates.—*Grossulariata* var. *lutea*, *lacticolor*, *varleyata*, *fulvaticata*, etc. *Desiderata*.—Other extreme forms of *Grossulariata*, or good vars. of *Diurni*.—*Rev. G. H. Raynor*, Hazeleigh Rectory, Maldon, Essex.

Desiderata.—*Euchloë cardamines* from Ireland; also types of *E. cardamines* from Switzerland, Italy, S. France; var. *turritis* (S. Italy), var. *volgensis*, var. *thibetana*, and of *E. gruneri*, *F. euphenoides*, *E. damone*, and any palearctic species of the genus. *Duplicates*.—*Loweia dorilis* and vars., a few minor vars. of *R. phlaeas* (British), and many British lepidoptera.—*Harold B. Williams*, 82, Filey Avenue, Stoke Newington, N.

Duplicates.—*Agrotis Ashworthii* and *A. Lucerneæ*. *Desiderata*.—*L. corydon*, var. *Syngrapha*, Irish butterflies and others.—*Joseph Anderson*, Alre Villa, Chichester, Sussex.

Duplicates.—*A. coridon* vars., including semi-syngrapha, *H. Comma*. *Desiderata*.—*A. coridon* var. *Albicans* (Spanish) and var. *Hispana* (do.), and good butterfly vars., especially from Ireland.—*Douglas H. Pearson*, Chilwell House, Chilwell, Notts.

CHANGES OF ADDRESS.—*C. W. Colthrup*, to 103, Woodward Road, East Dulwich, S.E. 22. *Colbran J. Wainwright*, to 139, Hamstead Road, Handsworth, Birmingham. *T. W. Hall*, to "Ardestie," Station Road, Chorley Wood, Herts. *Lieut. L. A. Box*, to 80, Northampton Road, Croydon. *B. H. Crabtree*, Holly Bank, Alderley Edge, Cheshire. *W. Mansbridge*, Dunraven, Church Road, Wavertree, Liverpool.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. 1919, February 5th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—*Meetings*: The second and fourth Thursdays in the month at 7 o'clock. January 23rd, Annual Meeting.—*Hon. Sec.*, Stanley Edwards, 15, St. German's Place, Blackheath, S.E. 3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society).—Hall 20, Salisbury House Finsbury Circus, E.C. The First and Third Tuesday in the month, at 7 p.m. Visitors invited. *Hon. Sec.*, J. Ross, 18, Queens Grove Road, Chingford, N.E.

Toynbee Natural History Society.—Toynbee Hall, at 8 p.m. Entrance fee 1s., annual subscription 1s. *Meetings*: Full particulars as to excursions can be obtained from the Excursion Secretary, Miss L. Roberts, 11, St. James' Hatcham, S.E. *Hon. Sec.*, Owen Monk, 8, Shooter's Hill Road, Blackheath, S.E.

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in each month from October to April.—*Hon. Sec.*, Wm. Mansbridge, 4, Norwich Road, Wavertree, Liverpool.

East London Natural History Society.—Bromley Public Hall, E. Thursdays at 8 p.m.—*Hon. Sec.*, J. C. W. Shears, 58, Selborne Road, Ilford.

Communications have been received or have been promised from Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, C. P. Pickett, Parkinson Curtis, H. Donisthorpe, A. Sich, Dr. Verity, C. W. Colthrup, Rev. C. R. N. Burrows, Dr. T. A. Chapman, Capt. Burr, G. T. Bethune-Baker, E. B. Ashby, P. A. H. Muschamp, J. H. Durrant, Orazio Querci, Capt. P. P. Graves, Rev. F. D. Morice, Lord Walsingham, Lieut. A. Box, Harold B. Williams, H. W. Andrews, etc., with Reports of Societies and Reviews.

All MS. and editorial matter should be sent and all proofs returned to Hy. J. TURNER, 98, Drakefell Road, New Cross, London, S.E. 14

We must earnestly request our correspondents NOT to send us communications IDENTICAL with those they are sending to other magazines.

Lists of DUPLICATES and DESIDERATA should be sent direct to Mr. H. E. Page, Bertrose, Gellatly Road, New Cross, S.E. 14

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

**H. W. HEAD, Entomologist,
BURNISTON, NR. SCARBOROUGH.**

Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

A Natural History of the British Butterflies,

Their World-wide Variation and Distribution.

A Text-Book for Students and Collectors.

Vol. IV.

By J. W. TUTT, F.E.S.

Price £1 1s. Od.

This volume comprises 373 pp. of text + 43 plates. The species dealt with are treated most exhaustively, and Lepidopterists will find worked out for them what are probably the finest life-histories ever published.

The work is regarded as the text-book on the subject; and in all probability will continue to be so for many years.

All up-to-date students should have a copy for reference.

To be obtained from—

Mr. H. E. PAGE, "Bertrose," Gellatly Road, New Cross, London, S.E. 14

Subscriptions for 1919 (10/- post free) should be sent to H. E. Page, "Bertrose,"
Gellatly Road, S.E. 14.

Vol. XXXI.

No. 2.

13,820

The Entomologist's Record AND Journal of Variation

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.

GEORGE T. BETHUNE-BAKER,

F.Z.S., F.L.S., F.E.S.

M. BURR, D.SC., F.Z.S., F.L.S., F.E.S.

(REV.) C. R. N. BURROWS, F.E.S.

T. A. CHAPMAN, M.D., F.R.S., F.E.S.

JAS. E. COLLIN, F.E.S.

H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

JOHN HARTLEY DURRANT, F.E.S.

ALFRED SICH, F.E.S.

(REV.) GEORGE WHEELER, M.A., F.E.S.,

and

HENRY J. TURNER, F.E.S.,

Editorial Secretary.

CONTENTS.

	PAGE.
Myrmecophilous Notes for 1918, <i>H. Donisthorpe, F.Z.S., F.E.S.</i>	21
A striking new species of <i>Catagramma</i> from French Guiana, <i>W. J. Kaye, F.E.S.</i> .. .	26
Seasonal Polymorphism and Races of European Grypocera and Rhopalocera, <i>Roger Verity, M.D.</i>	26
A Wander through Stainton's Hilly Field, <i>W. G. Sheldon, F.E.S.</i>	31
SCIENTIFIC NOTES AND OBSERVATIONS:—Food-plant and Rearing of <i>Hydroecia crinanensis</i> , (<i>Rev.</i>) <i>C. R. N. Burrows, F.E.S.</i>	33
NOTES ON COLLECTING:—Notes on Sherwood Forest, <i>Wm. Daws</i> ; Abundance of <i>Dryas- paphia, S. A. Chartres</i> ; An Early Record, <i>A. E. Tonge, F.E.S.</i> ; <i>Abrazas grossu- lariata ab. exquiseta</i> , (<i>Rev.</i>) <i>G. H. Raynor, M.A.</i>	33
CURRENT NOTES AND SHORT NOTICES	35
OBITUARY:—Hereward C. Dollman, <i>F.E.S., H.D.</i>	39
EDITORIAL, <i>G. T. B.-B.</i>	40
SUPPLEMENT, vol. xxx. (still further delayed).	

FEBRUARY 15th, 1919.

Price ONE SHILLING (NET).

— Subscription for Complete Volume, post free
(Including all DOUBLE NUMBERS, etc.)

TEN SHILLINGS.

TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,

"BERTROSE," GELLATLY ROAD, NEW CROSS, S.E. 14.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/5, 2/2, 2/6, 3/2. Folding Nets, 3/9, 4/3, 4/9. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 7d., 10d., 1/2, 1/10. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 9d. per four dozen, 1 gross, 2/-. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/7 per tin. Store-Boxes, with camphor cells, 2/3, 2/9, 4/-, 5/6, 6/8. Setting-Boards, flat or oval, lin., 6d.; 1 1/2 in., 8d.; 2 in., 10d.; 2 1/2 in., 1/-; 3 in., 1/4; 4 in., 1/6; 5 in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 10/6, 12/9, corked back, 15/9. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/9, 4/6, 5/6, 8/3. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/9 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3 1/2, 1/2 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/6. Glass-top and Glass-bottomed Boxes, from 1/3 per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d., 1/-; Blowpipes, 4d., 6d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families and for all insects liable to become greasy.

We stock various sizes and lengths of these Silver Pins which have certain advantages over ordinary entomological pins (whether enamelled black or silver or gilt).

NESTING BOXES of various patterns which should be fixed in gardens or shrubberies by lovers of birds before the breeding season.

SHOW ROOM FOR CABINETS

Of every description for INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS &c.

Catalogue (84 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic),
Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.

Bexley]

L. W. NEWMAN

[Kent

Has for sale a superb stock of 1918 specimens in fine condition, including Varleyata; Bicuspis; Pendularia var. Subroseata; Melanic forms Lariciata, Consortaria, Consonaria, Abietaria; Irish forms Aurinia and Napi, fine vars. Tiliae, Yellow Dominula, etc., etc. Quotations and Insects sent on approval with pleasure.

Also a huge stock of fine PUPÆ and OVA.

Write for latest price lists.

NOTICE:—Owing to huge rise in cost of metal, etc., my **Relaxing Tins** are now **3/6** small and **5/6** large, post free.

GALLS AND PIERCED BRAMBLE AND BRIER STEMS.—Mr.

L. A. BOX would be very grateful for any sorts and quantities, with localities, from all parts of the United Kingdom.

80, Northampton Road, Croydon.

Myrmecophilous Notes for 1918.

By H. DONISTHORPE, F.Z.S., F.E.S.

(Concluded from page 5.)

Acanthomyops (*Donisthorpea*) *niger* L.—This common species occurred in great abundance everywhere in the New Forest, occupying many situations under stones and in banks, etc., formerly inhabited by *Leptothorax interruptus*, *Tapinoma erraticum*, etc. I regard this ant as a great pest, and Dr. R. C. L. Perkins tells me his experience is the same in Devonshire; as when he had moved a stone over a nest of *Ponera*, or *Leptothorax tuberum*, etc., it was always taken possession of by the wretched *niger*.

The Myriapod *Polyxenus lagurus* was found in several *niger* nests in the Forest. A marriage flight took place near Beaulieu Road Station, on July 28th, in the afternoon.

Marriage flights of *niger* were observed on August 7th, at Charing Cross, on the Embankment, and at Putney; and again at Putney on August 20th. On the last occasion a sparrow was observed catching and devouring the winged female ants, leaving their wings on the ground.

On August 22nd, 1917, I captured a *niger* ♀ at Putney, which had removed her wings after the marriage flight, and placed her in a small plaster nest. She laid eggs in a few days, which hatched, but died when the nest got too dry. Eggs were laid again in September, which hatched; six small larvæ being present on January 1st, 1918. April 14th, larvæ larger, and a few eggs present. May 27th, three naked pupæ, small larvæ, and eggs present. June 16th, a ♂ hatched, which was eaten by the ♀. June 26th, another ♂ hatched. June 27th, two ♂ ♀ now present. Gave them some honey, the first food given to the ♀ since she was captured. The ♀ and both ♂ ♀ fed at the honey together. June 30th, ♀ considerably swollen. July 7th, fresh eggs laid, twelve small larvæ, ♀ and two ♂ ♀, well. August 1st, nine small cocoons and fourteen larvæ present. August 11th, one of the two ♂ ♀ dead. August 25th, five new ♂ ♀ hatched, five cocoons, twenty larvæ, and a few eggs present. September 22nd, eleven ♂ ♀, twelve larvæ and some eggs present. November 7th, the ♀ and eleven ♂ ♀ well, and fourteen medium larvæ present. Some of the eggs and some larvæ were used as food by the ♀, and also by the ♂ ♀.

A. (D.) alienus Först.—Hallet discovered this ant at Wallasey, in Cheshire, in April; a new county record for the species.

Formica rufa.—An interesting nest of this ant was observed near Holiday Hill, in the New Forest, on July 29th, which was situated all round a gate post. The materials of the nest were piled right up to, and on, the top of the post, and the space between the post and the gate was also filled with the same. Part of the post was hollow, and this, and the cracks in the post were also packed with pine needles, bits of stick, etc., etc., and a continuous stream of ants kept bringing up further materials. ♂ ♀ and dealated ♀ ♀ of *Leptothorax acervorum* were running about on the post among the *rufa* ♂ ♀, and in and out of the cracks. Numerous examples of the Bracon *Elasmosoma berolinensis*, and also ♂ of the Dipteron *Ceratopogon myrmecophilus*, were hovering over the ants and the nest. I have nearly always found these two insects present at the same time over *rufa* nests, though I do

FEBRUARY 15TH, 1919.

not know what the association can be. The Bracon is of course hovering over the ants to lay its eggs on them; whilst the Dipteron is probably only hunting for its own females. [I captured a ♀ of the *Ceratopogon* under a stone on a *rufa* nest at Weybridge on August 27th, 1918.] The construction of this nest calls to mind a somewhat similar case recorded by Forel near Munich, which was situated at the foot of two posts belonging to a balustrade bordering a thick forest [*Brit. Ants*, 251 (1915)].

In an enclosure near Mark Ash, all the large trees of which had been felled, a small hillock, built of large coarse materials, and inhabited by very large *rufa* ♂ ♀, was examined on the same day. As all the ♂ ♀ of this small colony were very large indeed; it is probable they had come from a very much larger nest, which had been disturbed by the removal of the trees from the enclosure.

Eggs were present (though I did not find a queen), and ♂ cocoons; fastened on to a number of the latter were specimens of the mite *Trachyuropoda coccinea*, its red colour showing up conspicuously against the buff ground of the cocoon. I have frequently found this mite in nests of *F. rufa*, but never before fastened on to the cocoons. *Beckia albina* was common in the nest, and a fine specimen of the beetle *Euthia plicata* was captured, quite at home among the fierce ants. There is little doubt that this beetle is a regular myrmecophile. Fowler records it from *rufa* nests at Buddon Wood, in Leicestershire, and Walker took it with the same ant in the Bleane Woods, Kent. It is much larger than our other British species, and I suspect some of our records, not with ants, really refer to *E. schaumii*.

On the Continent Märkel recorded it with *F. rufa* in Germany, and André with *F. exsecta* in France; Ganglbauer gives both species as its hosts.

At Weybridge on August 27th, September 4th and 18th, the bug *Pilophorus cinnamopterus* occurred in some numbers, on fir trees over *rufa* nests, in company with *rufa* ♂ ♀ attending Aphids. These bugs prey on the plant-lice, and obtain protection from their superficial resemblance to small *rufa* ♂ ♀. On the last mentioned date several specimens of *Pilophorus perplexus*, the ground colour of which being quite black, instead of red, as in specimens taken by me before, were beaten off birch trees, also in company with *rufa* ♂ ♀ and Aphids.

On August 27th, at Weybridge, I captured a larger species of bug which was on a fir tree over a *rufa* nest. On September 4th, another specimen was taken off the same tree. Mr. Butler, to whom I sent specimens, tells me it is *Megacoelum beckeri* Fieb., a species new to Britain (see *antea* p. 9). Subsequent hunting at Weybridge, when all fir and other trees, both near and away from *rufa* nests, were beaten, failed to produce more. On September 20th, however, when at Oxshott, three specimens of the same bug were beaten off different fir trees, in each case only over *rufa* nests in company with *rufa* ♂ ♀ and Aphids. I was beating fir trees all day, and Mr. Ashdown, who was with me, was beating all other trees for varieties of *Coccinellidae*, and it was only on fir trees over *rufa* nests that these bugs occurred. It would thus appear that this insect is associated with ants, much in the same way as are the species of *Pilophorus*.

The Myrmecophilous Lady-bird *Coccinella distincta* Fald., was

very abundant this year on various trees, fir, birch, and oak, etc., near *rufa* nests, in company with *rufa* ♂ & attending Aphids. I have been working at the association of this beetle with *F. rufa* for many years, and as I hope to write a paper on its life-history later on, I will only deal very briefly with the matter now. I found its larvæ in some numbers for the first time this year and reared them in captivity, and I am keeping a number of the perfect insect alive in a large *rufa* observation nest.

The marked difference in the treatment of the common *Coccinella 7-punctata* (a certain number of which occurred in company with *C. distincta* on the trees, etc., near the *rufa* nests) by the ants, from that exhibited by them to *C. distincta*, as I previously recorded in 1900 [*Ent. Record*, 12, 173-4 (1900)], was again noted this year; and on August 27th, I demonstrated the same for the benefit of Mr. Blair, when he went with me to Weybridge—he was much impressed by this.

Dr. Sharp has very kindly dissected the ♂ genitalia of *C. distincta* and of *7-punctata* for me, and he has found that they differ very greatly in this respect; those of *C. distincta* being very highly specialised.

Wasmann in a paper published in 1912 [*Zeitsch. wissens. Zool.*, 101, 112-14 (1912)] records *C. distincta* from Luxemburg, "always in the close neighbourhood" of various ants' nests. This is the first record on the Continent in which this beetle has been mentioned as being in any way connected with ants. He quotes my experiments, etc., at Weybridge, and says, "The larvæ of this *Coccinella* lives from analogy with the other Coccinellid larvæ without doubt, as Donisthorpe already in 1900 has remarked, on the *Aphidae* and *Coccidae* dwelling with ants." He goes on to say that the ant species with which it is most frequently found (*F. rufa*, etc., etc.) do not keep any *Aphidae* or *Coccidae* in their nests, but only seek such species to milk as occur everywhere outside their nests; and that this is a Darwinian paradox. He is not quite correct in stating that *F. rufa* keeps neither Aphids nor Coccids in its nests, as I have taken of the former—*Lachnus formicophilus* (only known from such situations), *Schizoneura corni* and *Aphis plantaginis*, and of the latter—*Orthozia cataphracta* and *Newsteadia floccosa*, in *rufa* nests. However this may be, when I found the *Coccinella* larvæ this year, they were feeding on the plant-lice attended by the ants on the fir trees over the *rufa* nests.

In 1908 I wrote [*Ent. Record*, 20, 283-4 (1908)]—"My present view is that these beetles seek the nests of *Formica rufa* for hibernation, and leave in the spring or early summer." I have taken them on and about *rufa* nests in every month from February to December inclusive. I hope to be able to visit the nests at Weybridge in January; and also to clear up the remaining points in its life-history.*

On April 21st to 29th my friend Mr. J. W. Allen collected a number of beetles in nests of *Formica rufa* (and also with other ants) at Lustleigh Cleave, S. Devon, and as a certain number of them are new county records it seems well to mention them all here.

In nests of *Formica rufa* :—

* As I was unable to go in January on account of my bronchitis, my friend Mr. Mitford visited the nests for me on January 27th, and found several *C. distincta* on fir-trees above the nests.

Thiasophila angulata, *Notothecta flavipes*, *N. anceps*, *Dinarda märkeli* (common), *Oxyptoda formiceticola*, *Myrmedonia humeralis*, *Quedius brevis*, *Xantholinus atratus*,* (*O. ochraceus*), *Trichopteryx montandoni*,* *Myrmetes piceus*, *Dendrophilus pygmaeus*,* *Monotoma conicicollis*.

In nests of *Acanthomyops* (*Dendrolasius*) *fuliginosus* :—

Myrmedonia laticollis, *M. humeralis*, *M. lugens*,* *Oxyptoda vittata*, *O. haemorrhoea*, *Notothecta confusa** (common), *Quedius brevis*, *Anphotis marginata*, (*Homalota circellaris*), (*H. fungi*).

With *Acanthomyops* (*Chthonolasius*) *flavus* :—

Claviger testaceus.

Formica rufa var. *alpina* Santschi.—Among some ants taken by Mr. G. A. J. Rothney, at St. Filans, Perth, in 1905, I detected specimens of *F. rufa* var. *alpina*; a new locality for this variety.

In August, this year, the Rev. J. W. Metcalfe sent me some ants to name (from Rannoch), and told me that he and Mr. F. C. Whittle had had a curious experience with regard to the little moth *Myrmecozela ochraceella* and the particular nest from which these ants came. They had searched every nest of *F. rufa* they could find at all times of the day with but small success, but when they found the nest in question they took 45 *ochraceella* at the first examination; a bag which was subsequently considerably increased. The vast majority of the moths were ♀♀, so this was not a case of assembling. I found that the ants were the var. *alpina*; and it is the first record of the moth being taken with this variety. It appears from what Mr. Metcalfe tells me, that the nest occurred quite near to the locality at Rannoch where I first discovered the ant in 1911. Later, Mr. Metcalfe very kindly gave me some of the long "cases," or rather "runs," of the moths' larvæ, consisting of bits of the nest materials all fastened together. I had been unable to find these when I captured the moth in 1900 and 1911.

Formica sanguinea Latr.—On May 25th a very large populous colony of *F. sanguinea* was found at Woking, situated in the stump of a large fir tree. After the most careful search no *fusca* ♂♂ were found in this nest. This is the first colony I have ever found, or know of, in Britain in which no slaves whatsoever were found. A small beetle flew up, and after hovering over the nest, settled on the stump and endeavoured to enter one of the galleries; it was captured and proved to be a specimen of *Notothecta flavipes*, a species usually found with *F. rufa*.

The one pseudogyne colony which occurs at Woking (*Brit. Ants*, p. 296) was also visited and found to be in a flourishing condition. It contained 3 deilated ♀♀, numerous ♂♂ and pseudogynes, but only a few larvæ were seen. This, however, was the case with all the *sanguinea* colonies this year, as they appeared to be very late as regards the brood.

In 1917, and again this year, a number of normal ♂♂ have been reared from eggs laid by the ♀ in my pseudogyne observation nest [*Ent. Rec.* 29, 49-50 (1917)]. As no pseudogynes have been produced from the eggs of this female, taken in 1916 with some of her ♂♂ and pseudogynes from a strongly infested colony, it shows at any rate that pseudogynes are not the result of pathogenic conditions in the egg, or mother queen.

* Those marked with an asterisk are new county records.

Formica fusca L.—Mr. Leman gave me specimens of *F. fusca* taken at Church Stretton, in Shropshire, in September; a new county record for this ant. A colony of this species was observed situated in a cavity at the foot of one of the posts supporting the porch at Ramnor Lodge in the New Forest. At 12.30 on July 25th winged ♀ ♀ were observed to emerge from the entrance to the galleries, and after running all about the porch to re-enter the nest. Though none were actually seen to take to the wing, they were evidently preparing for the marriage flight, which no doubt took place later in the day, as at 2.30 a ♂ was captured flying in the sand pit near Matley Passage.

Mr. Butterfield very kindly gave me a specimen of a *Ceratopogon* bred from one of several pupæ taken on the underside of a stone over a *fusca* nest at Grassington, Yorks, on May 5th. As this fly seemed to me to differ from the species (*C. myrmecophilus*) which I always find with the *F. rufa*, I submitted it to my friend Mr. J. Collin, who is of the opinion that it is *Ceratopogon braueri* Wasmann, a species new to Britain. Wasmann described it in 1893, having taken larvæ, pupæ, and perfect insects in nests of *F. fusca* at Vorarlberg.

I believe Butterfield's specimen to be a gynandromorph, as the antennæ, and also the pubescence on each side of the body, differ; Collin, however, is not I believe convinced of this. Butterfield in May, also at Grassington, found some 70 pupæ of the Dipteron *Microdon mutabilis* on the underside of a stone measuring 16" × 12", situated over a *fusca* nest.

Formica fusca var. *glebaria* Nyl.—Many nests of this variety were found in the New Forest in July. One very interesting colony was inhabiting a large sphagnum mound in Matley Bog, the galleries of the nest leading right down through the sphagnum to chambers in the very wet earth beneath. Some of the ♂ ♂ were very light in colour; ♂ ♂, ♀ larvæ and cocoons were present, but no winged ♀ ♀ were seen, and *Beckia albina* was the only myrmecophile found. A small colony had established its nest by the side of a path through Denny Bog, the mound over the nest being covered with tiny pebbles from the path. Several large colonies were dwelling in large mounds by the side of the railway; these mounds being covered with little bits of cinders (no doubt picked up by the ♂ ♀ on the line) which gave them a curious black appearance. The brood of these colonies only consisted of ♀ larvæ, cocoons and naked pupæ; no sexes being found. In one of them, on July 22nd, a Cynipid and three specimens of *Atemeles paradoxus* were taken. This beetle, which has not been found in the New Forest before, is decidedly scarce in Britain; the only other localities known to me in which it has occurred are Folkestone, Charlton, Bournemouth, Isle of Wight, Weston-super-Mare, Land's End, and the Plymouth district. In the last-named locality it was originally taken by Reading, and more recently by Keys, with whom I have had the pleasure of finding it, and also alone. Very many nests, however, had to be examined before a series could be obtained.

Formica picea Nyl.—Several nests of this ant were found in the original spot in Matley Bog, where I discovered it in 1914 (*Brit. Ants*, p. 333), but on July 18th a new locality was found further in the Bog, and here the ant was abundant. Over 20 nests were counted, 14 occurring in the space of a few square yards, nearly every tussock among

the sphagnum being occupied by them. Nearly all those examined contained two or more queens, sex pupæ in cocoons, larvæ and naked ♀ pupæ, but in only one was a ♂ seen. Every nest was inhabited by the Coccid *Pseudococcus sphagni* Green, discovered by me, new to science, in 1914. They occurred loose in the galleries, and on roots of grass running through the nests, and the *picea* ♀ ♀ at once endeavoured to carry them into safety, when the nests were disturbed. The Coccid *Newsteadia floccosa* also occurred in several nests, but pupæ (♂ and ♀) of the fly *Platyphora lubbocki* were found in nearly every one. These pupæ were loose in the galleries and among the bits of cut grass and sphagnum of which the nests were mostly built.

A striking new species of *Catagramma* from French Guiana.

By W. J. KAYE, F.E.S.

Catagramma polypygas, n.sp.

♂. Forewing with the narrow base and broad apical area dark brownish black. Outer margin narrowly black at vein 2, and becoming slightly wider at tornus. A very broad flame-red discal patch extend to costal margin and to inner margin but scarcely reaching tornus. Along median vein there is a slight extension inwards towards base. Outer margin slightly excised in middle. Hindwing deep violet blue, shading off into the velvety black ground colour at apex. Outer margin strongly toothed at the extremities of the veins. Underside of forewing as above except for a short yellowish costal stripe from base; an ochre yellow curved stripe before apex followed by a short blue curved line at a short distance beyond. Cilia white at tip, black to vein 4 and alternately black and white to tornus. Underside of hindwing with markings as in *hydaspes*. Ground colour ochreous, a broad curved black stripe just inside inner margin. A large elliptical black central area containing four blue spots with white centres. From the upper edge of the black elliptical patch there runs a black curved line, edged externally with blue, merging with outer margin at tornus.

♀. With more rounded wings and outer margin of forewing rounded and slightly scalloped. Red area very large. Hindwing black, with a fragment of a blue subterminal line on outer margin just before tornus.

Exp. ♂ 46 mm., ♀ 48 mm.

Habitat, French Guiana, Lower Maroni River. 2 ♂ ♂ and 1 ♀. Types in coll. Joicey.

Seasonal Polymorphism and Races of some European *Grypocera* and *Rhopalocera*.

By ROGER VERITY, M.D.

The following is an extract of a more extensive paper, in which I have compared the seasonal and geographical variation of the species occurring in Tuscany, with those of other Italian and European regions. The present difficulties as regards printing will probably make it impossible to publish it for some time; moreover, most of its contents will chiefly interest Italian readers; I have consequently drawn out

this short summary of the new forms described in it, and of some observations which may interest English readers also, and I have added a few descriptions drawn from material of other Italian localities. Those who may wish for further information and details will find them in the fuller Italian work, to be published as soon as possible, probably in the *Redia*, edited in Florence.*

Erynnis (Carcharodus) altheae, Hüb., race AUSTRALIFORMIS, mihi. This form stands to *altheae* as *australis*, Z., stands to *alceae*, Esp. In Tuscany, and probably in the whole of S.E. Europe, it constitutes the second and third generations. It is much smaller than the nimotypical form; the contrast between the dark pattern and the light ground colour is sharper.

Erynnis (Carch.) lavatherae, Esp., race AUSTRALIOR, mihi, corresponds exactly to the former by its size and pattern: replaces the larger form entirely in Tuscany.

Erynnis (Carch.) boetica, Ramb., race ROSTAGNOI, mihi. Smaller, darker (more brown and less greenish) than the Spanish race figured by Rambur, more similar to the Pyrenean race figured by Oberthür [*Ét. de Lép. Comp.*, v., fig. 609-10], but not named by him; different from the race *octodurensis*, Obth., of the Valais, and from the Sicilian race, which should be called OBERTHÜRI, having been well figured by this author (fig. 605-6), but not named by him either. My type of *rostagnoi* is from Oricola, in the Latium, 900m., where it was collected by Rostagno 4th of August 1913, but never recognised by him, the species having been till now unknown in Italy; this unique specimen is now in my collection.

Hesperia idae, Esp., race OCCIDENTALIS, mihi. No one seems to have as yet observed how different the race of W. Europe is from the Russian one figured by Esper; the form is much smaller, lighter in colour, and less boldly marked.

Hesperia armoricanus, Obth., second gen. FULVOINSPERSA, mihi. The great majority of individuals of the second brood (August and September) differ from those of the first by having the whole of the wings tinged with yellow-fulvous, so that the dark pattern is brownish and the light spaces yellowish. Specimens of *armoricanus* very similar to *onopordi*, such as that figured by Obthür in vol. iv. of the *Ét. Lép. Comp.* (fig. 509-10, occur also in Tuscany, but are very rare; they well deserve the name of ONOPORDIFORMIS, mihi.

Hesperia onopordi, second gen. FULVOTINCTA, mihi. Similar to the corresponding summer form of the preceding species. Individuals of the two broods, with the upperside densely scaled with white, can be designated by the name ALBOVELATA, mihi.

* When no particular locality is mentioned in the description of new forms and races, it should be understood that the "types" in my collection are from the neighbourhood of Florence.

Hesperia malvoides, Elw. and Edw., race TUTTI, mihi. I propose this name for the very distinct race from Locarno, which Tutt [*Brit. Butt.*, i., p. 225 (May, 1906)] described, but wrongly referred to *melotis*, Dup., a distinct oriental species.

Powellia sao, second gen. GRACILIS, mihi. Same colouring as the summer forms mentioned above, but also often much smaller than the spring one.

Thymelicus acteon, Rott., race RAGUSAI, mihi. This is, as far as I know, the most distinct race of the species which is so constantly invariable over the whole of its range; it seems quite constant in Sicily; the "types" in my collection are from Palermo and S. Martino alle Scale; its characteristic is the total absence of the dark suffusion over the entire surface of the wings, making them similar to those of *lineola*, i.e., fulvous with a narrow black margin, and showing only in some specimens a faint trace of the dark suffusion.

Augiades sylvanus, Esp., race SEPTENTRIONALIS, mihi. Although this species does not vary much geographically, there is a distinct difference between the more northern races, such as the English one, and those produced further south; the former tend to melanism and produce such extreme forms as *obsoleta*, Tutt, and *paupera*, Tutt, which are never met with in the latter, where most specimens belong on the contrary to the forms *opposita*, *clara* and *extensa*, of the same author; series from England and series from France or Italy have in consequence a very distinct look. The specimen described, figured by Esper, was from France, and quite corresponds by its appearance to the southern race. I suggest the English race should be designated by the name mentioned above; my "type" specimens are also distinctly smaller than the usual continental ones.

TERSAMONIA, mihi. The genus *Chrysophanus* has recently been subdivided into several minor genera; evidently this is quite right, but to my knowledge no name has yet been proposed for this very distinct group: *thersamon*, *lampon*, *satraps*, and *asebinus*; taking the first as typical, I should suggest the name TERSAMONIA.

Lowia alciphron, Rott., race MIRABILIS, mihi. This may well be said to be the finest race of the species, on account of its large size and gaudy colouring; these characters at once distinguish it from the much smaller nimotypical race of central Europe, the male of which it resembles by the dark suffusion covering the entire wing and the inconspicuous, and often entirely absent, black spots; in *mirabilis*, too, the anterior area of the hindwings is of a brighter orange fulvous, contrasting with the rest of their surface, which is dark, and shows off the brilliant purple gloss; the latter characters are similar to those of *meliboens*, Stdgr., from Greece, but in this race the surface of the wings is generally less darkened and the black spots large. The female was described from the race *romanorum*, Frbst., of the high Apennine, more similar to *gordius* in both sexes, but which occurs also in *columbanus*, De Prun., from Piedmont, in *calabra*, Vrtz., and even in *gordius*; some females of *mirabilis* have a black suffusion over the forewing.

My typical series of this race is from the southern slopes of the Mount Senario hill, not far from Florence.

Loweia dorilis, Hufn., race ITALORUM, mihi. Compared to the nimotypical race of Berlin the Italian race is seen to be larger, the submarginal fulvous lunules are larger and more vivid in both sexes; the black shading, which is conspicuous in many males of the former on the underside, entirely disappears; the black shading of the upper-side of the female is always very reduced and entirely absent in the great majority of specimens, which belong to the form *phocas*, Rott. (= *fulvior*, Stef.). There is no seasonal polymorphism, as in the Spanish *bleusei*, Obth.

Glaucopsyche cyllarus, Rott., race PAUPER, mihi. Size lesser than in the central European race, and extremely small specimens quite frequent; females very often with no trace of blue scaling on upperside, and always restricted to a small basal area when present; bluish or greenish scaling of underside never reaches the outer half of the costal zone of hindwings, and never extends beyond the series of black spots. It must be noted that the females of *pauper* with no blue scales are not *andereggii*, Rühl., from the Valais, the latter being of a much darker tinge both on upper and underside; Rühl's "type" is in Florence, in the collection of the R. Stazione d'Entomologia Agraria. I name COMPLETA the form of the male with a distinct series of submarginal dots on the upperside.

Scolitantides baton, Brgstr. Very early spring specimens (April) of the first gen. are always extremely small, and have a very white underside with small black spots and narrow orange band; the females are abundantly suffused with blue on the upperside, so much so that some are difficult to distinguish from the males (form *PRÆCOCIOR*, mihi.). Most specimens of the second generation (August) are also extremely small and have an underside colouring which is distinctly brownish (form *OBSCURATA*, mihi.).

Agriades aragonensis, Vrtý., race SAXONICA, mihi. In the paper in which I separated this species from *coridon*, Poda [*Ann. Soc. Ent. de France*, lxxxiv., p. 517 (1916)], I pointed out that the large insect from Dresden, Berlin, etc., with very wide black marginal band and a distinct green colouring, instead of a bluish one, seems to belong to the former rather than to the latter. In that paper I used the name *viridescens-marginata*, Tutt, but, on second thoughts, it strikes me that such a compound name is perfect to designate specimens of *coridon* of any locality, which are slightly green and have a wider black margin, such as are often met with, but that it is quite necessary to distinguish from them the very different German form bearing many characters besides these two.

Agriades thetis Rott., race ETRUSCA, mihi. First gen. MAJA, mihi., and second gen. ETRUSCA, mihi.; race INALPINA, mihi.; race APENNINICOLA, mihi.; race BRITANNORUM, mihi.; race VECTAE, mihi. Rottemburg's typical specimens were from Landsberg, on the Warte; taking the central European race on the whole, it reaches as far south as Pied-

mont, but further on the species acquires such a different look that it is surprising no one should have as yet described it. The race of Central Italy resembles more the Spanish *alfacarensis*, Ribbe, but may be distinguished from it, more or less, by the same characters as distinguish the Spanish *A. aragonensis* from its Tuscan race. Comparing Tuscan series with series from Central Europe the following differences are clearly seen: in *etrusca* the size is slightly larger, the wings are more rounded; in the male the black streaks at the marginal end of the neuration are less distinct or absent; the black submarginal dots are less frequent and less conspicuous when present; the underside colouring is constantly totally different in the two sexes, whereas in the northern race it is so similar in both sexes that even such a minute analyser as Tutt described their variations as one; seasonal dimorphism is constant and striking, whereas further north it is so inconspicuous that Tutt is quite sceptical as to whether it exists at all. Our first generation differs less from the nymotypical race, our second generation is the most characteristic of *etrusca*. In my original paper I have accurately compared these three forms and made out their differential characters, which it would be too long to transcribe here.

I wish to draw attention to the fact that even in the large group of Central European races taken as a whole, several will probably emerge on comparison of sufficiently large series; for instance, the Alpine race, as illustrated by a series collected in the Valais by Wulschlegel, and now in my collection, is far from identical with races of the plain; the submarginal series of black dots of the male is much more conspicuous; the underside is very dark and in some individuals contrasts with a wide marginal white zone, somewhat as in *hylas*; the white rings round the black dots are very wide and the latter tend to obliteration; females with reduced or no blue scaling are quite frequent; race *INALPINA*, mihi.

A sharp contrast exists between these Alpine characters and those displayed by *thetis* in the higher regions of the Apennines as compared to *etrusca*, showing quite a different mode of variation; the same contrast I have shown to exist in *coridon* from the Alps and *coridon* race *sibyllina*, Vrtý., from the mountain tops of the southern part of Central Italy. Here in both species the size is very small, the underside is extremely pallid (entirely pure white in culminating male individuals), the black dots very minute, the premarginal lunules of a pale yellow colour in the male and pale orange in the female (race *APENNINIGENA*, mihi). Typical series from the Sibilline mountains in the Pieno at 1200 mm., collected by Querci.

Turning our attention again to the Central European group of races, it may be noticed that the English one differs markedly from Rottemberg's race of the Warte in an exactly opposite direction from the Italian one, the race of Northern France (Eure) coming near to it; the females are more blue; the lunules have a lesser extent and are less vivid; the underside of the male is darker and less frequently tinged with fulvous; the black dots are smaller and set in a more regular median series. This I gather from a series collected by the late Conquest in June, 1906, and August, 1905, at Cuxton (Kent); I suggest the name *BRITANNORUM*, mihi. Another very striking and interesting race was collected by the same entomologist in May, 1875, at Ventnor, in the Isle of Wight, and subsequently purchased by me;

it is so different from any other as to give the impression of an aberration amongst races; it is very small and weak looking; the blue of the male is very silvery, more like *hylas* than the usual *thetis*; nearly all the specimens bear a series of minute premarginal black dots; the females are nearly all destitute of orange lunules or show three or four small ones, so much so that one of them, with very little blue scaling, looks exactly like an Italian female of *cyllarus*; the others are very blue, the underside of both sexes is very dark; the black spots vary in extent, but their white rings are very narrow; the orange lunules are very pale; the two basal black dots of the forewings are wanting in 8 specimens out of 21, which is a very high percentage indeed. This remarkable race is certainly worthy of the name of *VESTAE*, and I should be grateful for information about it.

Agriades escheri, Hüb., race *TURATI*, mihi.—Several races of this species have already been described, but the one collected by Count Turati at Salsomaggiore, in the province of Parma, is certainly distinct from them all; very large (mm. 33-30 of expanse); underside of male nearly entirely white, that of female of a greyish brown and displaying none of the brilliancy of the race *splendida*, Stef.; all the black pattern is very reduced as in *rondoui*, Obth.; orange lunules pallid and small, leaving a wide premarginal white space round the submarginal black dots; the latter are conspicuously pupilled with scales of a metallic green, in a way that is not seen in any other race; the female has very reduced lunules on upperside; the blue scaled female form *subapennina*, Turati, is comparatively frequent. I should name this race *turati*.

(To be continued.)

A Wander through Stanton's "Hilly Field."

By W. G. SHELDON, F.E.S.

In the days when I was in my teens an acquaintance lent me several odd volumes of the *Intelligencer*, and in these were various accounts of the wonders of insect life to be found in the then famous "Hilly Field," near Mickleham, in Surrey. I made up my mind that, given an opportunity, I would visit this renowned locality, and in early June, 1882, being then resident in London, I started for it, but not until the 28th day of July last did I actually arrive at my destination.

The reason of my very slow progress was a question of misdirection. I was told to make for the Dorking end of Headley Lane, to proceed up it until I reached the end of the wall on the righthand side, and then to turn in on the right through a short wooded lane, and I should see the "Hilly Field" in front of me. I followed out these directions, and *did* find a "Hilly Field" which answered botanically to the object of my search; I have visited there many times since, but it never came up to my expectations entomologically.

I suppose I should have rested contented to the end that I had succeeded in finding the object of my search, had I not last winter, in conning over some early volumes of the *Zoologist*, come across an article by J. W. Douglas, which gave full directions for reaching the *real* "Hilly Field," and I saw at once that I had been "sold," whether intentionally or not I shall never know.

The "Hilly Field" was one of a number of localities worked by Stainton, and probably by every other micro-lepidopterist resident in or near London in the middle of last century. Stainton conducted parties there, and used to advertise the excursion in his magazine, the *Entomologist's Weekly Intelligencer*, thus, "Mr. Stainton will be at Mickleham this evening, and will proceed to Headley Lane at 7 p.m. Incipients, who are too shy or too afraid of intruding, to come to 'Mountsfield' (his residence), may perhaps pluck up courage to meet one in a lane!"

Following Douglas's instructions, I—in imagination—met Stainton, and proceeded with him up Headley Lane for a mile or more, until I came to a farmhouse on the right; a few yards past this a stile is found in the fence of the wooded hillside on the left. Getting over this stile one breasts the hill steeply for a dozen yards or so, when an old path, deeply sunk in the chalk of the hill-side, crosses the track by which it is reached, at right angles; one turns along this to the right, and keeps to it, not leaving it for any cross paths, until the end of the wood is reached, when the *real* "Hilly Field" is seen in front of one.

Seen, but alas, not reached; for it is now encircled with a very nasty barbed wire fence, difficult to negotiate. The reason for which is that the field is now sacred to the culture of "Brer Rabbit," legions of which useful rodent make their home in it. The wire fence is not absolutely unclimbable, and after a search I found a vulnerable spot and entered.

I was not molested on this, or on a subsequent visit which I made; gamekeepers have been practically non-existent during the past few years, and one has been able to wander almost anywhere without let or hindrance; I suspect, however, when times get normal it will be different, and the "Hilly Field" will be "taboo" to most of us. It appears to be now very much what it was when Stainton and his company rambled through. One description of it is "there are so many flowers that the grass is without room to grow," and certainly the sward is almost entirely composed of the flowering plants that are so conspicuous on a chalk down, marjoram, woodsage, *Inula conyza*, and *Pastinaca sativa* were amongst the most conspicuous; less so, but almost equally abundant, were *Prunella vulgaris*, wild strawberry, *Erigeron acris*, and many others the names of which I do not now remember.

One of the characteristics of the spot was said to be "that there were as many insects as flowers," and certainly this description applies now. *Pyrausta purpuralis* and *P. ostrinalis* were in thousands, one is tempted to say millions, on the occasion of my first visit, *Sericoris rivulana* was almost as abundant. "One does not usually meet with this species in great numbers!" an old friend, who had studied micro-lepidoptera for perhaps half a century, said to me a short time ago. I wished I had him with me! *Peronea aspersana* flew in dozens, with plenty of *Setina irrorella*. A pair of *Cedematophorus lithodactyla*, knocked out of *Inula conyza*, puzzled me, I did not recognise this as a food-plant of the species, and had hopes that they might prove to be *Hellensia carphodactyla*, with which I was not familiar. Amongst *Erigeron acris* I found *Eupoecilia anthemidana* common, they flew freely by six o'clock in the evening (summer time). A clump of spruce trees, planted since Stainton's time, produced numerous examples of *Paedisca*

ratsburghiana, probably earlier in the season they would have been good for other species. *Tineina*, which were the chief objects that the old lepidopterists visited the place for, were in shoals, and of many species.

I did not succeed in finding the special object of my visit, *Oxyptilus pilosellae*, which was formerly taken commonly, and of which there are quite a number of examples in the National British collection, labelled by Stainton himself. The food-plant, *Hieracium pilosella*, does not now seem abundant, in fact it was hardly seen. I did obtain one worn specimen of *O. heterodactyla (teucriti)*, probably this was abundant earlier in the season.

I passed several pleasant hours wandering about, and saw enough of the old locality to realise its attractions, or some of them, and I felt I could almost see Henry Tibbats Stainton, the man who made microlepidopterists by the hundred, and his friends and disciples, Douglas, Machin, Healey, Jenner Weir, Standish, and the others who lived many long happy hours here when good Queen Victoria was still young, but who have all long since vanished into the land of shadows.

SCIENTIFIC NOTES AND OBSERVATIONS.

THE FOOD-PLANT OF *HYDROECIA CRINANENSIS*.—The enquiry in the *Record* of January for further information on the above subject has brought me several replies. Mr. J. G. Le Marchant who has, from the first, taken the imagines in numbers, in Scotland, in the neighbourhood of Aberfeldy writes of the two glens in which he has collected: "I never saw an *Iris* plant in either glen. It is curious that I scarcely ever saw a specimen away from the rivers."

Sir Charles Langham writes me that in his neighbourhood, Co. Fermanagh: "As far as I can tell we get only *H. crinanensis* in this Demesne, which has large quantities of yellow *Iris* growing in most of the low-lying fields. With the help of the late Mr. J. E. R. Allen, I examined a number of the specimens, and we came to the conclusion that *crinanensis* is the only *Hydroecia* taken in this place."

Can it be possible that the *Iris* is inconspicuous at the time when the imago is about?

I may add that Mr. Le Marchant repeats his observation that the moths were observed in numbers "on the flowers of the small *scabious* and appear to love the sunshine."—C. R. N. BURROWS, Mucking. 31st January, 1919.

NOTES ON COLLECTING, Etc.

A FEW MORE NOTES FROM SHERWOOD FOREST.—Since my last notes on Sherwood Forest my son has only paid a few visits in search of Lepidoptera, for he found early in the year that the greater portion of the Forest where he did most of his collecting had been cut down for government use, and that the greater part of the undergrowth has also been destroyed by the heavy timber "drugs" and traction-engines in hauling the timber away. With the presence of the large gangs of men, and the fallen trees, it was not at all pleasant to collect there, and he gave it a short rest and took up angling instead. During one of his early spring visits he found a pupa of *Drepana binaria* spun up in oak

leaves. The pupa was covered with a delicate bloom similar to that covering the pupa of *Calymnia trapezina*. On April 26th a fine female emerged, the first specimen either of us has taken here. In April also he saw a large number of *Brephos parthenias* flying around the birch trees, but at too great a height to obtain. Sherwood Forest is a poor place for butterflies, only the commonest species occur, the three "whites," the common "blue," the small "copper," and the small "heath," with the small "tortoiseshell" later in the year. In the autumn, on the trunks of trees, he took *Cerastis vaccinii*, *Miselia oxyacanthæ* ab. *capucina*, and *Cosmia paleacea*. He also found a few larvæ of *Hylophila prasinana*, all but one of which were stung. Later on he took both light and dark forms of *Epirrita (Oporabia) dilutata* in plenty, and also made a selection of the forms of *Hibernia defoliaria* sufficient to renew my series of seventy specimens varying from slightly dusted forms, which look almost unicolorous, to forms with very dark ground, almost dark red-brown with still darker bands, and also some with cream coloured ground and very dark bands, very handsome specimens. *Cheimatobia boreata* and *C. brumata* could be taken in any number on the tree-trunks. In October my son took a larva of *Dasychira pudibunda* on an oak trunk, apparently preparing to spin up. From it was bred, on December 27th, a fine female. The pupa had been kept in the kitchen.—WM. DAWS, Wood Street, Mansfield.

ABUNDANCE OF DRYAS PAPHIA.—I thought it might be of interest to report the capture of the following:—While staying at Brockenhurst in July I had the good fortune to capture a fine variety of *Dryas paphia* male. Forewings nearly entirely suffused with black. Hindwings striated. In practically perfect condition. I also took a number of var. *valesina*. The *paphia* were in the utmost profusion.—S. A. CHARTRES, 45, King's Drive, Eastbourne. January, 1918.

AN EARLY RECORD.—On November 24th last I took a specimen of *Phigalia pedaria (pilosaria)* at Reigate. I believe this to be the earliest date ever recorded for this species.—A. E. TONGE, Reigate, Surrey. December, 1918.

ABRAXAS GROSSULARIATA AB. EXQUISITA.—I am delighted to know that my old friend Mr. Porritt possesses specimens of the very beautiful and distinct ab. *exquisita*. I cannot, however, follow his argument that the mere fact of his possessing specimens should have deterred me from giving it a varietal name. According to Mr. Porritt it is not advisable to name a variety of *varleyata*, even if it is recurrent (as in the case of ab. *exquisita*), yet I find that in *The Entomologists' Monthly Magazine* for April, 1917, he himself has named a certain form *albovarleyata*! It is as well, of course, to use discretion in these matters and not to multiply names unnecessarily. Last year I had the intense gratification of rearing a few specimens of *varleyata* in which the white markings are replaced by yellow, or even by a beautiful orange, but I am content to label these as *varleyata-lutea*, instead of creating a new piece of nomenclature. I have now been studying this protean protean species for twenty years, and I have not come across a more striking form than the one to which I deliberately gave the

name of *exquisita*.—(REV.) G. H. RAYNOR, M.A., Hazeleigh Rectory, Maldon. 4th February, 1919.

CURRENT NOTES AND SHORT NOTICES.

Many annual publications have been late in appearance owing to the abnormal conditions brought about by the war. Still that they have been able to continue to appear is a matter for congratulation. The forty-eighth *Annual Report of the Entomological Society of Ontario* (1917) has recently come to hand. After the usual Society Reports, of Council, Librarian, and Curator, the Annual Meeting received reports of the Branches at Montreal, Toronto, British Columbia, and Nova Scotia, and a series of special reports on the injurious insects of the year from the various divisions of the Province of Ontario. These are all printed with the addition of the numerous papers read at the sessions, including "Notes on the Imported Onion Maggot (*Hylemyia antiqua*) and its Control," by A. Gibson; "Some Important Insects of the Year," by L. Caesar (the blackberry leaf-miner = *Metallus bethunei*; the zebra caterpillars = *Ceramica picta*; the codling moth = *Carpocapsa* (*Cydia*) *pomonella*; the white-marked tussock-moth = *Hemerocampa* (*Orgyia*) *leucostigma*; the wheat midge = *Contarinia tritici*; the eight-spotted forester = *Alypia octomaculata*; etc.); "The Apple and Thorn Skeletonizer (*Hemerophila pariana*)," by E. P. Felt; "Some Notodontian Larvæ," by the Rev. Dr. J. A. Corcoran; "The Problem of Mosquito Control," by Thos. J. Headlee (Registration of Areas, Acquirement of Funds, Means of Elimination, Execution of Plans, Valuation of the Results of the various Controls, Conclusion and Results so far); "The Black Cherry-aphis," by W. A. Ross (giving the results of a large number of breeding experiments); "Trans-Canadian Spiders," by J. H. Emerton; "A Further Report on the Value of Dusting versus Spraying to control Fruit Tree Insects and Fungus Diseases," by L. Caesar (showing the much greater advantage from the latter method of control); "A few Notes on the Ecology of Insects," by W. Lockhead (Inter-relations between insects and plants, Insectivorous plants, Bacteria and fungi, Insects as carriers of plant diseases, Insects and birds, Insects behaviour towards stimuli, such as light, heat, gravity, moisture, contact, etc.); "Notes on an Unusual Garden Pest in Nova Scotia, *Gortyna micacea*," by W. H. Brittain; and various records of captures make up a very useful and interesting annual of some 130 pages; most of the contributions are illustrated.

The *Transactions of the London Natural History Society* for 1917 was published late in the year. It contains the usual summary of the meetings with many interesting entomological items. Then follow the various reports of the sectional activities, which apparently have been successfully continuing. Only two of the more lengthy papers have been included, (1) "A Spring and Summer at Oxshott," an extremely useful and interesting paper, by Russell E. James, containing a full account of the Lepidopterous Fauna of a well-known and delightful Surrey rendezvous. (2) "The Report of the Birds of Epping Forest for the year 1917," for the Ornithological Committee, by A. Brown, Secretary.

The *Ent. Mo. Mag.* for November contains an interesting account of the occurrence in some numbers of the Buprestid beetle *Melanophila acuminata*, during the progress of a pine-wood fire at Crowthorne, Berks, many specimens being captured even on the still smoking trunks, by Messrs. W. E. Sharpe and Bedwell; and Commander Walker gives an account of the Butterflies of the Oxford district.

The *Ent. News* for November has a note on an attack by a dragon-fly larva on a water-snake, causing its death; a statistical paper on Protandry in Bees and lengthened period of flight by the females after the males have disappeared; and a discussion of the assertion that Seasonal Dimorphism occurs in the females of certain species of Mealy Bug (*Coccidae*) with a result pointing to a negative reply.

The *Naturalist* has kept up its interesting contributions to natural science very ably during the period of the war. The November number contains a continuation of the fully annotated list of the Spiders of Yorkshire, by W. Falconer; records of the occurrence of various species of insects generally scarce in the northern counties, such as *Rumicia phlaeas*, *Gonepteryx rhamni*, *Cicindela campestris*, *Nephodesme (Sciaphila) sinuana*, etc.; and contributions to the discussion on Scent Glands in Lepidoptera recently begun in its pages.

In the *Bull. Soc. ent. France* for November, L. Demaison discusses the distribution of *Saturnia pavonia*, from the mountains in the north of Europe to the Mediterranean Sea, from Skye in the Hebrides to the summit of the Flégère, near Chamonix, and records an example of the melanic form *infumata*, Newnham, which he points out was figured many years ago by Engramelle (Sup., plate ii., fig. 178 *i*, *k*), and also refers to fig. 178 *l* on the same plate, depicting an aberration of the male with hindwings entirely of a bright orange. He also names an aberration of *Ennomos erosaria* as ab. *angulifera*, in which the two black oblique lines on the forewings, well separated on the costa, are united to form a sharp angle before reaching the inner margin. At the same time he points out that Engramelle figures an aberration of this species with these lines quite obsolete as ab. *unicoloria*.

In the same number, M. J. de Joannis contributes an article on the presence in France of *Grapholitha (Laspeyresia) leplastriana*, Curtis, an insect which some entomologists have doubted ever to occur outside England, where it is confined to the neighbourhood of Dover. Then follows a very complete history of the species from the observations of Stainton, Mann, Zeller, Merrin, Weston, Elisha, C. G. Barrett, etc. Recently it has been met with at Niort, and M. de Joannis has received it from Italy (Fano) from Prof. Cecconi. In England the species has only one generation, the imago occurring in July and August, but in Italy there are two generations, in July and again in September.

In the *Scottish Naturalist* for November is an article by W. Evans, on "Insects and other Terrestrial Invertebrates from the Bass Rock." He gives a list of Lepidoptera, Diptera, Hymenoptera, Coleoptera, etc., recorded. There were two species of butterflies, *Aglaia urticae* (dead), and *Pieris brassicae* (one). *Xylophasia monoglypha (polyodon)* was a common visitor to the lantern, *Charaas graminis* were also in numbers. Odd specimens of about a dozen species of *Noctuidae*, plenty

of *Gelechia* (*Lita*) *obsoletella* among *Atriplex*, and of course *Oecophora pseudospretella* from the lighthouse itself. There is one record which requires completion, that of "pupa cases common on stones," etc., among *Silene maritima*. The moths emerged in July and were identified for me by Mr. Barrett, *Coleophora solitariella*." Now *C. solitariella* has nothing whatever to do with *Silene*, but is attached exclusively to *Galium holostea*. Does this plant grow there? The cases, of course, are distinct enough. Of the Hymenoptera, two ants are recorded, *Tetramorium caespitum* and *Myrmica ruginodis*, one *Vespa*, *V. sylvestris* and two *Bombus*, *B. lapponicus* and *B. terrestris* race *lucorum*. About a dozen species of Coleoptera and one Orthopteron (*sens. lat.*), the ubiquitous *Forficula auricularia*.

The following is a list of the Officers and Council of the Entomological Society of London for the ensuing year. *President*, Comm. J. J. Walker, M.A., R.N., F.L.S.; *Treasurer*, W. G. Sheldon; *Secretaries*, Rev. G. Wheeler, M.A., F.Z.S. and Dr. S. A. Neave, M.A., F.Z.S.; *Librarian*, G. C. Champion, F.Z.S., A.L.S.; *Council*, E. C. Bedwell, G. T. Bethune-Baker, F.L.S., F.Z.S., K. G. Blair, B.Sc., Malcolm Cameron, M.B., R.N., W. C. Crawley, B.A., J. Hartley Durrant, Dr. H. Eltringham, M.A., F.Z.S., Dr. C. J. Gahan, M.A., Dr. A. D. Imms, B.A., F.L.S., Dr. G. A. Marshall, F.Z.S., Rev. F. D. Morice, M.A., and H. E. Page.

The *Canadian Entomologist* for November has (1) an article on "Insect Tropisms," the behaviour of insects in response to the environment in which they live. (2) A record of a "Long-fasting Lepidopter," twenty-four cocoons of a moth, *Rothschildia jorulla*, were received from Texas in May, 1915, collected in the autumn of 1914, and the emergences were, October, 1915, one; October, 1916, three; July and September, 1917, two; April and May, 1918, one. (3) A new species of the Order *Zoraptera*, from the United States, *Zorotypus hubbardi*. The only species known previously are *Z. guineensis* (Africa), *Z. ceylonicus* (Ceylon), *Z. javanicus* (Java), and *Z. neotropicus* (Costa Rica), all described by Prof. Silvestri, of Portici, Italy.

The *Entomologist* for November contains articles on the Lepidoptera of Purbeck in 1918, Cannock Chase in 1918, a record of *Anosia plexippus* (which?) taken in Cornwall, and notes on minor butterfly aberrations in 1918.

In the *Ent. Mo. Mag.* for December R. S. Bagnall announces a *Campodea* (*C. devoniensis*) as new to science, from the neighbourhood of Torquay. J. E. Collin announces the occurrence of the Dipteron *Hormopeza obliterated*, associated with the rare beetle *Melanophila acuminata* on burning pines in Berkshire, sent to him by Messrs. W. E. Sharp and Bedwell, and hitherto only recorded from Finland.

An aberration of the larva of *Eumorpha elpenor* is recorded in the *Irish Naturalist* for December, "remarkable in having three pairs of well-defined eye-markings, showing as six eyes when the sphinx attitude is assumed, and remarkable also in having the caudal horn reduced to little more than a rudiment."

The gold medal of the Linnean Society has been awarded to Dr. F. D. Godman, the surviving author editor of the *Biologia Centrali Americana*.

In the *Entomological News* for December Prof. Skinner reports a

gynandromorph example of the large *Callosamia angulifera*. "The wings of the left side are of the dark colour of the male and the antenna of this side is male. The wings and antenna of the right side are female in colour and character. The specimen was a captured one." There is also a nomenclatorial article by J. McDunnough on the "Dates of Issue of the Plates of Guérin's *Iconographie du Règne Animal* (Lep.)."

The *Entomologist* for December contains (1) "A Month's Collecting at Rannoch," by the Rev. J. W. Metcalf. (2) "A Season's Entomology in South Hampshire," and (3) "Some Notes on the New Forest in July, 1918."

The following is a list of the Officers and Council of the South London Entomological and Natural History Society for the present year: *President*, Stanley Edwards, F.L.S., F.Z.S., F.E.S. *Vice-Presidents*, K. G. Blair, B.Sc., F.E.S., and H. J. Turner, F.E.S. *Treasurer*, A. E. Tonge, F.E.S. *Librarian*, A. W. Dods. *Curator*, W. West. *Editor of Proceedings*, H. J. Turner, F.E.S. *Hon. Secretary*, Stanley Edwards, F.L.S. *Council*, B. W. Adkin, F.E.S., R. Adkin, F.E.S., W. J. Ashdown, R. T. Bowman, E. J. Bunnnett, M.A., A. W. Dennis, F. W. Frohawk, F.E.S., M.B.O.U., Lachlan Gibb, F.E.S., and T. W. Hall, F.E.S.

After nearly a quarter of a century as Hon. Treasurer of the South London Entomological Society, Mr. T. W. Hall is retiring this year. Owing to his removal beyond the London outskirts, and continued increasing pressure of business, he has been compelled to give up the office which he has held so long. It is a difficulty always to so marshal the finances of a Society as to publish an adequate report of its proceedings. With Mr. Hall's assiduity it has always, even during the war period, been possible for the Council to publish an annual which is a credit to the Society, and that "without breaking the bank." To Mr. T. W. Hall we owe many thanks.

In the January number of the *Ent. Mo. Mag.*, Dr. Chapman continues his contributions to the egg-laying of the sawflies, in an account of the habits of *Emphytus serotinus*, which is attached to oak, Dr. R. C. L. Perkins, in the same number, lists the Additions to E. Saunders' Catalogue of British Hymenoptera since 1902, and also the changes in Nomenclature.

The first two parts of the Transactions of the Entomological Society of London have come to hand. It contains (1) "Coleoptera from the Seychelles and Aldabra Islands," by Antoine Grouvelle, with two plates. (2) "New Species of *Staphylinidae* from Singapore," by Malcolm Cameron, M.B., R.N., F.E.S. (3) "Australian *Braconidae* in the British Museum," by Roland Turner, F.Z.S., F.E.S. (4) "On the Naming of Local Races, Sub-species, Aberrations, Seasonal Forms, etc." by Lord Rothschild, F.R.S. (5) "*Molippa smillima*," with two plates, by E. Dukinfield-Jones, F.E.S. (6) "On Mimicry in certain Butterflies of New Guinea," by Dr. F. A. Dixey, M.A., M.D., F.R.S. (7) "An Instance of Mutation in *Coccidae*," with four plates, by K. Kunhi Kannan, M.A., F.E.S. (8) "Notes on the same," by E. Ernest Green, F.Z.S. (9) "Observations on the Lepidopterous Family *Cossidae* and on the Classification of the Lepidoptera," by A. Jefferis Turner, M.D., F.E.S. (10) "The *charina* group of *Pinacopteryx*," by Dr. Dixey, M.A., M.D., F.R.S. (11) "Studies in *Rhyncophora*," with one

plate, by David Sharp, M.A., F.R.S. (12) "Notes on the Ontogeny and Morphology of the male genital tube in *Coleoptera*," with one plate, by F. Muir, F.E.S. There are also thirty-two pages of the Proceedings, containing a large number of smaller communications on the exhibits at the meetings, including many observations made by Fellows in the interior of Africa.

The Aculeate Hymenoptera seem to be attracting a considerable amount of attention during the past year. Several erstwhile persistent students of the Orders Coleoptera and Lepidoptera for many years past have taken up the study of one section or other of this Order, and reports of their captures and observations are coming more frequently into the pages of the magazines. The *Irish Naturalist* for January contains an account of the Hymenoptera observed during 1918 in the counties of Donegal, Fermanagh, and Armagh, from the pen of the Rev. W. F. Johnson. No doubt such books as Sladen's *The Humble-bee, its Life-history and how to Domesticate it*, J. H. Fabre's *Bramble Bees and Others*, Donisthorpe's *British Ants*, etc., have helped to encourage this attention.

The *Naturalist* for January contains the "Report of the Yorkshire Naturalists' Union" for the year 1918. The part devoted to the Entomological Section deals with Lepidoptera by B. Morley, Coleoptera by Dr. W. J. Fordham, Neuroptera and Trichoptera by G. T. Porritt, Hymenoptera, Diptera, and Hemiptera by J. F. Musham, Diptera by L. Butterfield, and Arachnida by W. Falconer.



B I T U A R Y .

Hereward Chune Dollman, F.E.S.

Hereward Chune Dollman died of sleeping sickness on January 3rd, 1919, in his 30th year, and thus was cut short at an early age the promise of a brilliant career.

Born on March 10th, 1888, he was educated at St. Paul's School and St. John's College, Cambridge. He obtained an open Scholarship in Natural Science at St. John's in 1906-1907 and an exhibition for Cambridge on leaving St. Paul's.

The St. Paul's School Museum contains many exhibits of his, representing Insect Metamorphosis, Protective Coloration, Mimicry, and the like. He was a very good tennis player, and played for his College when at Cambridge both in Tennis and La Crosse.

He commenced his entomological work at the early age of five, and, as with so many others, his first love was British Lepidoptera; but subsequently, while still at school, he took up the study of British Coleoptera. Well do I remember his first visit to me, as a schoolboy armed with a letter of introduction from his father, and how struck I was at once with his quickness and grasp of the subject, his vitality and "joie de vivre."

Many an excursion we took together in the following years before he left England, and no one could have wished for a more interesting companion, while his energy and generosity in the field filled one with admiration and affection.

Before passing on to his work abroad, one may mention among his many interesting captures and discoveries in the British Coleoptera

—*Stenus formicetorum*, Mann, added to the British list in 1910, and *Longitarsus plantago-maritimus*, Dollman, a species new to science, discovered and described by him in 1912. On January 3rd, 1913, he left England for Central Africa to act as entomologist to the British South African Company in connection with their sleeping sickness survey.

Most of his time was spent at Mwenga and Kashitu, where, besides his work on the "Fly," he studied various problems of malaria, and made a very exhaustive collection of North West Rhodesian Coleoptera, as well as Lepidoptera; and a large number of ants, which, with his usual kindness and generosity, he presented to me.

His chief work was of course in connection with the "Tsetse" fly, and he set himself to find, if possible, some parasite that would stamp it out. In this he was partially successful in the discovery of a species of *Mutilla*—*Mutilla glossinae*, Turner, a species new to science. The account of this remarkable discovery and his beautiful paintings of the ♂ and ♀ of the *Mutilla* can be found in the *Trans. Ent. Soc. of London* for 1915, pts. iii. and iv., pp. 394-96.

He returned home in October, 1915, and married on February 23rd, 1916, Norah, eldest daughter of Dr. and Mrs. Holloway, of Bedford Park, taking her back with him to Central Africa. They crossed N.W. Rhodesia, reaching Kasempea in June, where on July 5th she died, passing away in her sleep.

After this he moved to Solwezi and began his work with Lepidoptera, breeding as far as possible, and making most beautiful and elaborate drawings of the larvæ.

Towards the close of 1917 he realised that he had got infected with sleeping sickness, and on his return to England in the autumn, he pushed on with his work on the South African Lepidoptera, endeavouring to get as much done as possible before the end. He had brought back a very large collection of live pupæ, which are still hatching out.

On Sunday, December 29th last, he was taken ill with fever—which rapidly got worse—and died of sleeping sickness in the early hours of January 3rd.

His African collections, containing many thousands of specimens and much that is new, are to go to the National Collection.—H.D.

EDITORIAL.

We much regret to have to announce that our esteemed colleague J. R. le B. Tomlin has felt obliged through pressure of other work to retire from our table of Editors. Mr. Tomlin's knowledge of our Coleopterous fauna was a great asset to us and his practical help in more ways than one, and particularly in the preparation of the Index, will be much missed. He wanted to retire soon after war broke out, but kindly consented to remain for the duration of the war. From the first entomology has been with him a "side line," for his first love is shells, and with the heavy task of the editorship of the "Malacological Journal" on his hands, we feel really grateful to him for sticking to the ship during the rough times through which we have been passing. We regret also to announce that Professor T. Hudson Beare has likewise sent in his resignation.—G. T. B.-B.

The Back volumes (I-XXX) of the *Ent. Record*, &c. (published at 10s. 6d. net), can be obtained direct as follows—Single volumes, 7s. 6d., except vols. I. and II., which are 10s. 6d. each; of the remainder 2 or 3 volumes, 7s. 3d. each; 4, 5, 6, 7, 8 or 9 vols., 7s. each; 10, 11, 12, 13 or 14 vols. at 6s. 9d. each; 15, or more vols. at 6s. 6d. each. Back copies of the Magazine at double the published price (plus postage). Special Indexes to Vols. III-XXX, sold separately, price 1s. 6d. each.

Subscriptions for Vol. XXXI. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 [This subscription includes all numbers published from January 15th to December 15th, 1919.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Ten Shillings, and must be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14. Cheques and Postal Orders should be made payable to H. E. PAGE.

ADVERTISEMENTS of Books and Insects for Sale, or Books wanted will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14

Subscribers who change their addresses must report the same to Mr. H. E. PAGE "Bertrose," Gellatly Road, New Cross, London, S.E., otherwise their magazines will probably be delayed.

Articles that require Illustration are inserted on condition that the author defrays the cost of the illustrations.

All Foreign Exchange Magazines must be forwarded to H. J. TURNER 98 Drakefell Road, New Cross, S.E. 14

Duplicates.—*T. pruni* (fair types), *Pisi* (bred), *Lucipara* (bred), pupæ of *Lanestrus*. *Desiderata*.—Very numerous to renew and extend.—*Wm. Foddy*, 39, *York Street, Rugby*.

Duplicates.—**Dissimilis*, *Velleda*, *Fibrosa*, **Ambigua*, *Fulva*, **Lubricipeda* var. *Fasciata*, **Plantaginis*, *Coracina*, *Captiuncula*, *Mundana*, *Lutosa*, *Togata*, **Valerianata*, *Cilialis*, *Inquinatellus*, *Caledoniana*, *Variegana* vars. *Sauciana*, *Geminana*, *Cinerana*, *Brunnichiana*, *Schulziana*, *Congelatella*, *Occultana*, *Vectisana*, *Dorsana*, *Rusticana*, **Suboccelana*, **Strobilella*, *Nanana*, *Herbosana*, *Petiverella*, *T. corticella*, **Ecop*, *Fulvigtella*, etc. *Desiderata*.—Good *Pyræles*, *Tortrices*, etc.—*T. Ashton Lofthouse, The Croft, Linthorpe, Middlesbrough*.

Desiderata.—*Pieris napi*—spring and summer broods with exact data (localities and dates)—from all parts of the Kingdom, especially North of England and Scotland; *Pararge ægeria* from Scotland, Ireland, and North of England—exact data needed. Will do my best in return or pay cash.—*G. T. Bethune-Baker*, 19, *Clarendon Road, Edgbaston*.

Duplicates.—*Varleyata* and other varieties of *Grossulariata*. *Desiderata*.—Good varieties and local forms. *Spilosoma urticae*, *Advenaria*, and other ordinary species to renew old series. Good *Tortrices* and *Tineæ*.—*Geo. T. Porritt, Elm Lea, Dalton, Huddersfield*.

Duplicates.—*Grossulariata* var. *lutea*, *lacticolor*, *varleyata*, *fulvaticata*, etc. *Desiderata*.—Other extreme forms of *Grossulariata*, or good vars. of *Diurni*.—*Rev. G. H. Raynor, Hazeleigh Rectory, Maldon, Essex*.

Desiderata.—*Euchloë cardamines* from Ireland; also types of *E. cardamines* from Switzerland, Italy, S. France; var. *turritis* (S. Italy), var. *volgensis*, var. *thibetana*, and of *E. gruneri*, *F. euphenoides*, *E. damone*, and any palearctic species of the genus. *Duplicates*.—*Loweia dorilis* and vars., a few minor vars. of *R. phleas* (British), and many British lepidoptera.—*Harold B. Williams, 82, Filey Avenue, Stoke Newington, N.*

Duplicates.—*Agrotis Ashworthii* and *A. Lucerneæ*. *Desiderata*.—*L. corydon*, var. *Syngrapha*, Irish butterflies and offers.—*Joseph Anderson, Abre Villa, Chichester, Sussex*.

Duplicates.—*A. coridon* vars., including semi-syngrapha, *H. Comma*. *Desiderata*.—*A. coridon* var. *Albicans* (Spanish) and var. *Hispana* (do.), and good butterfly vars., especially from Ireland.—*Douglas H. Pearson, Chilwell House, Chilwell, Notts*.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. 1919, March 5th, 19th; April 2nd; May 7th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—*Meetings*: The second and fourth Thursdays in the month at 7 o'clock.—*Hon. Sec.*, Stanley Edwards, 15, St. German's Place, Blackheath, S.E. 3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society).—Hall 20, Salisbury House Finsbury Circus, E.C. The First and Third Tuesday in the month, at 7 p.m. Visitors invited. *Hon. Sec.*, J. Ross, 18, Queens Grove Road, Chingford, N.E.

Communications have been received or have been promised from Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, C. P. Pickett, Parkinson Curtis, H. Donisthorpe, A. Sich, Dr. Verity, C. W. Colthrup, Rev. C. R. N. Burrows, Dr. T. A. Chapman, Capt. Burr, G. T. Bethune-Baker, E. B. Ashby, P. A. H. Muschamp, F. H. Durrant, Orazio Querci, Capt. P. P. Graves, Rev. F. D. Morice, Harold B. Williams, H. W. Andrews, Russell James, etc., with Reports of Societies and Reviews.

All MS. and editorial matter should be sent and all proofs returned to Hy. J. TURNER, 98, Drakefell Road, New Cross, London, S.E. 14

We must earnestly request our correspondents *NOT to send us communications IDENTICAL* with those they are sending to other magazines.

Lists of **DUPLICATES** and **DESIDERATA** should be sent direct to Mr. H. E. Page, Bertrose, Gellatly Road, New Cross, S.E. 14

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.

Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

G. A. Bentall, F.Z.S.,

~ NATURALIST. ~

100 **Carton Store Boxes**, $15\frac{1}{2}'' \times 10\frac{1}{4}'' \times 2\frac{1}{8}''$, wood sides, hinged lid, covered dark leather paper, lined white inside, prepared cork bottom lining, 3/- each, carriage 6d. extra.

150 **Dustproof white wood double Store Boxes**, $17'' \times 12'' \times 3''$. Shouldered lids, edges corner locked inside, lined cork top and bottom and covered white paper. Outside finished plain and fitted with 2 hinges and catches, 10/9 each. Also stocked in walnut.

Prepared Cork Sheets, $12'' \times 16''$, 4/6 per doz., 5d. per sheet.

500 **Strong Glass Killing Bottles**, fitted with cork bung, 2/- each. Larger size, 2/6 each.

1000 yds. **White Tiffany** (soft finish) for sleeving, etc. 30'' wide, 10½d. per yd.

A large stock of **British, Continental, and Exotic Lepidoptera.**

Birds' Eggs and Cabinets. **Setting Boards.**

Setting Houses. **Breeding Cages.**

Travelling Boxes, with and without setting boards.

Pins, entomological and black glass headed. **Tracing Paper** for setting.

ALL GOODS CARRIAGE PAID OVER 20/-.

Price Lists post free on request.

DUDLEY HOUSE, SOUTHAMPTON ST. (opposite Hotel Cecil),
STRAND, W.C. 2.

Subscriptions for 1919 (10/- post free) should be sent to H. E. Page, "Bertrose,"
Gellatly Road, S.E. 14.

Vol. XXXI.

13720

No. 3.

The Entomologist's Record AND Journal of Variation

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.

GEORGE T. BETHUNE-BAKER,

F.Z.S., F.L.S., F.E.S.

M. BURR, D.SC., F.Z.S., F.L.S., F.E.S.

(REV.) C. R. N. BURROWS, F.E.S.

(REV.) GEORGE WHEELER, M.A., F.E.S.,

and

HENRY J. TURNER, F.E.S.,

Editorial Secretary.

T. A. CHAPMAN, M.D., F.R.S., F.E.S.

JAS. E. COLLIN, F.E.S.

H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

JOHN HARTLEY DURRANT, F.E.S.

ALFRED SICH, F.E.S.

CONTENTS.

	PAGE.
A Note on <i>Orgyia vetusta</i> , T. A. Chapman, M.D., F.R.S.	41
Seasonal Polymorphism, Roger Verity, M.D. (continued)	43
NOTES ON COLLECTING :—Treacle in December, Russell James; Some Lepidoptera of an Essex Wood, Id.; Treacling in 1918, Id.; Random Notes from North-East Ireland, Harold Williams; Notes on Lepidoptera in 1918, Alfred Sich	43
CURRENT NOTES AND SHORT NOTICES	57
SOCIETIES :—The South London Entomological Society; Lancashire and Cheshire Ento- mological Society	58
SUPPLEMENT. (Completion not yet received.)	

MARCH 15th, 1919.

Price ONE SHILLING (NET).

Subscription for Complete Volume, post free

(Including all DOUBLE NUMBERS, etc.)

TEN SHILLINGS.

TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,

"BERTROSE," GELLATLY ROAD, NEW CROSS, S.E. 14.

WATKINS & DONCASTER.

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/5, 2/2, 2/6, 3/2. Folding Nets, 3/9, 4/3, 4/9. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 7d., 10d., 1/2, 1/10. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 9d. per four dozen, 1 gross, 2/-. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/7 per tin. Store-Boxes, with camphor cells, 2/3, 2/9, 4/-, 4/6, 5/6, 8/8. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1¼; 4½in., 1½; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 10/6, 12/9; corked back, 15/9. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/9, 4/6, 5/6, 8/3. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/9 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, 1/2 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/6. Glass-top and Glass-bottomed Boxes, from 1/3 per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d., 1/-; Blowpipes, 4d., 6d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families and for all insects liable to become greasy.

We stock various sizes and lengths of these Silver Pins which have certain advantages over ordinary entomological pins (whether enamelled black or silver or gilt).

NESTING BOXES of various patterns which should be fixed in gardens or shrubberies by lovers of birds before the breeding season.

SHOW ROOM FOR CABINETS

Of every description for INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS &c.

Catalogue (84 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).
Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.

Bexley]

L. W. NEWMAN

[Kent

Has for sale a superb stock of 1918 specimens in fine condition, including Varleyata; Bicuspis; Pendularia var. Subroseata; Melanic forms Lariciata, Consortaria, Consonaria, Abietaria; Irish forms Aurinia and Napi, fine vars. Tiliae, Yellow Dominula, etc., etc. Quotations and Insects sent on approval with pleasure.

Also a huge stock of fine PUPÆ and OVA.

Write for latest price lists.

NOTICE:—Owing to huge rise in cost of metal, etc., my **Relaxing Tins** are now **3/6** small and **5/6** large, post free.

GALLS AND PIERCED BRAMBLE AND BRIER STEMS.—Mr. L. A. BOX would be very grateful for any sorts and quantities, with localities, from all parts of the United Kingdom.
80, Northampton Road, Croydon.

A Note on *Orgyia vetusta*.

By T. A. CHAPMAN, M.D., F.R.S.

Towards the end of 1917 Dr. J. W. H. Harrison gave me three egg masses of *Orgyia vetusta*, a Californian species. They were a large and two smaller ones.

During May, 1918, and on into June 7th, over 400 larvæ hatched. I did not note the first day of hatching, but on June 7th I thought they must nearly all have hatched, as the emergences were falling off, and some larvæ were well grown in their third instar. By the 9th, however, 32 more larvæ had hatched, between the 9th and 11th 35 appeared, and they continued hatching for another month; the numbers being—

June 9th, 32; 11th, 35; 13th, 46, one is now in 4th instar; 15th, 20 in last two days; 17th, 24; 19th, 29; 21st, 19; 23rd, 19; 25th, 11; 27th, 10, at this date the earliest larvæ spun up in 5th instar; 29th, 6; July 1st, 8; 3rd, 3; 5th, 1; 7th, 2; 9th, 3; 11th, 1; 13th, 4, the last to hatch. Total, 273.

The long period over which the hatching spread, about ten weeks, is quite parallel to that of *O. antiqua*, making many observers believe that species to be double-brooded; this is the case more or less in the South of Europe, but in the British Isles, never. Well, hardly ever!

The dates of spinning their cocoons were taken roughly, by taking the cocoons in batches a few days after each lot was completed, largely with the view of finding relative dates for male and female larvæ spinning up.

The first larva to spin up did so on June 27th. By July 10th a number had done so, and had moulted to pupæ, so that the sexes were unmistakable, and afterwards a census was taken, as convenient, as each lot reached this stage.

The results were as under—

The spinning occupied two months. The 5th and 6th lots, and again the 8th and 9th, should probably be taken together, as I think they were affected by my separating the larvæ with a view to detect whether the females moulted once more than the males. It is obvious that the males spun up sooner than the females, not because they hatched earlier, but because they had less feeding to do.

			♂ ♂	♀ ♀
July 10	...	...	52	1
	Of next lot	...	21	7
July 11	third lot	...	22	38
	fourth lot	...	10	2
„ 14	fifth lot	...	29	77
„ 21	sixth lot	...	79	60
„ 23	seventh lot	...	34	31
„ 27	eighth lot	...	6	37
Aug. 1	ninth lot	...	26	2
„ 4	tenth lot	...	30	30
„ 13	eleventh lot	...	13	38
„ 10	twelfth lot	...	2	5
„ 21	...	...	1	4
there remaining as larvæ, apparently			2	4
Totals			327	336

MARCH 15TH, 1919.

We may add these up thus ;—

	Males.	Females.
First 4 lots to July 14 . . .	105	48
Next three lots to July 23 . . .	142	168
Remainder to August 21 . . .	80	120
	<hr/> 327	<hr/> 336

These were dates, I may repeat, of counting, the mean dates of spinning up would be about a week or ten days earlier.

Though the moths look very different from *O. antiqua*, and their habits of egg-laying are very different, the larvæ very much resemble those of the "common vapourer." They have more brilliant red tubercles and want the lateral tufts of hair, but are otherwise very close. I was interested to discover whether the larvæ had the curious moulting discrepancy of *O. antiqua*, in which species each brood may be said to have two sets of larvæ, one set having one more moult than the other, and in each set the females one more moult than the males.

I carefully noted a very large number of larvæ, chiefly by passing them forward to another jar as they moulted, but I found that apart from this each instar had such distinctive plumage that all the remainder obviously confirmed the results of the more carefully noted sections. The result was that no larva spun up in the fourth instar, but all did so in the fifth, with an interesting exception. Amongst 336 female larvæ that spun up all but 14 did so in the fifth instar, but these 14 took another moult, that is, entered a sixth instar. These grew decidedly larger than the others, but presented no difference in plumage.

This shows a very distinct constitution from that of *O. antiqua*. My recollection of the larva of *O. splendida* is that they gave no indication of variation in the number of moults, though I made no exact observations from the first stage onwards.

The number of extra-moulters (in females only) amounted to 4% of the female larvæ, and may probably be regarded as being merely ordinary variation as to moulting that occurs in so many species, giving of course in all such species a basis for selection to such definite specialities of moulting as occur in *O. antiqua* and in *Arctia caja*, and many others. I give this as my own view, though it might no doubt be taken to be the remains, by regression, of such a habit as obtains in *O. antiqua*.

I may briefly note the plumage of the five several instars. In the first the prothoracic projections are obvious, but there are no hair tufts—full grown length 5.5mm. to 6.0mm. In the 2nd instar the tufts are all represented, but so weakly that they have to be looked for, and might on a superficial glance be regarded as absent—length full-grown 7mm. to 9mm. In the third instar all the tufts are very obvious, almost conspicuous. In the fourth the tufts are markedly larger than in the third. The dorsal tufts are of a dirty white, darker certainly, but all four are not of uniform tint. In the fifth (and last) instar the tufts are all larger.

The dorsal tufts are now all of the same coloration, pure white at moult and may remain so, but generally get darker medially down the

dorsal line, even quite black; the white gets yellowish towards spinning up. The lateral red tubercles are usually very brilliant.

The sizes of the heads at each instar are distinctive.

The moths pair as soon as an opportunity offers. The female, which emerges from the cocoon and rests on it, is supplied with good legs and antennæ.

She lays her eggs in a mass on the cocoon, or beside it, if she has moved, or wherever she may happen to be. The eggs are intermixed with wool from the body and with some glutinous material that makes them adhere, as a solid lump. The egg mass is laid in layers, and each layer is covered outside by a separate line of wool, so that a newly laid mass is rather neat with its rows of felted thatch. Without any special interference these rows gradually become less obvious and the covering looks more uniform, possibly by the contraction of the cementing material. An unfertilised female lays her eggs irregularly, sometimes in a long string, in which case the cementing material, which cannot be seen in an egg mass, exhibits very numerous pearl-like air bubbles.

There is a good deal of variation in the male moths, from very dark to quite pale, and in the intensity of the markings, and as to which of these are more pronounced than others. There is also great variation in colour of the females. The general body is pale mouse colour, but the wool clothing the last segments, used for covering the eggs, varies much, from pure white to nearly black.

I was very much struck by the healthiness and vigour of the larvæ. I do not think I exaggerate in saying that none died except by accident, though I had a good many of them unduly crowded at times.

I was very careful to let none escape, and I have now many eggs that I must destroy, as it was obvious that they would be a serious plague to our apples and plums, if they were as healthy and hardy at large as they were in captivity. It is very probable that, as natives of California, our climate would not suit them, and an attempt to acclimatise them here would be as unsuccessful as such attempts with *Lymantria dispar* are. Nevertheless, I feel satisfied that such an attempt would be quite unjustifiable.

Seasonal Polymorphism and Races of some European Grypocera and Rhopalocera.

By ROGER VERITY, M.D.

[CORRECTIONS AND EMENDATIONS.—p. 27, l. 17, for "less greenish" put "variegated;" l. 25, for "unknown" put "only found once;" l. 29, before "form" insert "western."

p. 28, l. 32, correct to *asabinus*; l. 44, after "female" insert "chiefly belongs to the form *intermedia*, Stef., which;" last l., for "some" put "only a few;" l. 11, "alle" = "delle."

p. 29, for *bleusei* put *cleusei*.

p. 30, l. 31, after "characters" insert "as compared to the nymotypical one;" l. 41, mm. = m.

p. 31, l. 9, before "very" insert "always;" l. 12, VESTAE = VECTAE; l. 14, TURATH = TURATI; l. 19, *splendida* = *splendens*.]

Agriades thersites (Cant.), Chapm., race MERIDIANA, mihi: first

generation HIBERNATA, mihi; second generation MERIDIANA, mihi.—The nymotypical form of this species, first described by Chapman, is the second generation of a French race, having two broods, but in which no difference was, according to its author, detectable to the naked eye between the first and the second. The microscope revealed remarkable differences in the structure of the scaling, which were very accurately described by Chapman himself a year after the discovery of the species in the *Trans. Ent. Soc. of London*, October, 1914, p. 309. I think such a distinct form should have a name by which to distinguish it, and I suggest that of *hibernata*; it can be extended to races with one generation only, as Chapman has shown that they are identical with the first generation of the double-brooded ones. In Italy the first generation is equally identical with *hibernata*, so far as I can make out, but the second generation differs from it considerably by very constant characters, parallel to those exhibited by *Polyommatus icarus*, Rott., *A. thetis*, Rott., and *A. aragonensis*, Vrtý.; the most constant of these is the total absence or very great reduction of the metallic scaling of the underside; then comes the distinctly fulvous tinge, often very bright in the females, of the ground colour of the same surface; a slight touch of it may be seen also in June specimens of the first generation, but the presence of a wide-spread metallic scaling leaves no doubt as to what brood the specimen belongs; no trace of blue scaling is present in the females of the second brood on the upperside; this character is also sometimes seen in late June specimens of the first brood; I propose the name INTERJECTA for intermediate seasonal forms exhibiting characters of the second generation, but having the constant metallic scaling of the first on underside. The name *meridiana* mentioned above is no doubt necessary to designate the second brood, different also to the naked eye, from the first, and it should be extended to the entire double-brooded races which produces it, taking the Florentine one as nymotypical of it.

Polyommatus icarus, Rott., race ZELLERI, mihi, *celina*, Aust, and first gen. PULCHERRIMA, mihi. Zeller (*Isis*, 1847, p. 154) well described the southern race as compared to the Central European one of Rottemburg, but gave it no name. Tutt suggested the name *meridionalis*, but unfortunately he had already used it for what he thought was the corresponding form of *coridon*, and which instead turned out to be a different species (= *A. aragonensis*, race *rezniceki*, Bartel); this makes it impossible to use the name for any *Lycanidi*. I should replace it by the name *zelleri*, the names *vernalis* and *aestivalis*, also of Tutt, holding good for its two broods. Another observation is necessary: the name *zelleri* must be restricted to the less southern area of Southern Europe, for in the extreme south, such as in Sicily, as well as in Morocco, another race makes its appearance, characterised by the presence of numerous individuals of the form *celina*, Aust., with a comparatively wide black marginal streak on all the wings of the male, and generally, but not always, as it is erroneously believed, with conspicuous black submarginal dots; the name *celina* should be used in a general way for the whole of the latter race; it also differs from *zelleri* in the first generation by producing also in this brood males with the black dots mentioned above, whereas they only occur in the second brood of *zelleri*; the females are the most beautiful of the species, because they

associate large, vivid, orange marginal lunules with a wide-spread blue suffusion; I should call the first brood of *celina* *PULCHERRIMA*, taking as typical a series collected by Querci at S. Martino, near Palermo. Seitz, in *Gross-schmett*, i., p. 312, mentions this lovely form from Africa and Sicily, but makes the blunder of giving it the name *rufina*, Obth., which was meant only for female specimens in which the orange lunules diffuse inwardly to an enormous extent and reach the discoidal cell, such as are found now and then amongst the *pulcherrima*.

Cyaniris semiargus, Rott., race *PORRECTA*, mihi; race *QUERCII*, mihi; race *AUSONIDARUM*, mihi. In Tuscany the race of the plain may be referred to *cimon*, Lewin, but in the higher Apennines quite a different one occurs, to which the name *porrecta* may well be applied, its wings being very elongated and angular on account of the shortness of the hinder neurulation (anal) as compared to the fore ones (radial), and on account of the much straighter termen, thus making it the mountain form corresponding to *allous* of *Aricia medon* in this respect; the underside is a little darker than that of the race of the plains, but the black margin of upperside is not wide, as in the Alps. The latter character combined with those of *porrecta* is, on the contrary, frequent in the race found by Querci on the highest tops of Calabria (race *QUERCII*, mihi). The most distinct of the western races is the beautiful one found by Querci on the Aurunci Mountains (Caserta); it measures even in the male sex 29mm. of expanse, thus being much larger than *cimon* (26mm.), and it is of a clear, vivid blue, giving it the appearance of a *cyllarus* above, and a very narrow, sharp, black border increasing the resemblance; the underside is dark and brownish.

Plebeius argus, L.,* race *APENNINICOLA*, mihi; race *ITALORUM*, mihi; race *TUSCANICA*, mihi; race *LUNENSIS*, mihi; and race *CALABRICA*, mihi. The race for which I propose the first of these names is similar to the well-known alpine *philonomus*, Berg., which has been renamed so often, but it differs from it in constantly having the ground colour of the underside of the male of a perfectly pure white, and in being on an average smaller, and sometimes extremely small (18-20mm.); my typical series is from Mount Pratofiorito (at 1000m.), near Lucca; it contains the only female from Tuscany I have ever seen bearing blue scaling above. In the Apuane Alps, which stand close by, but have quite a different alpine geological structure, the race *philonomus* is produced. Not far off, on the Abetone Pass (1,300m.) a third race is to be found; it is the largest of the Tuscan ones (22-25mm.); the black margin is narrower than in the preceding and the blue is brighter; the black dots of the underside are very small, and the median series is very straight (race *ITALORUM*); in other localities intermediate races occur. The Tuscan race of the plains has, as in other countries, a very narrow black marginal band on the upperside of the male, nearly obliterated on the forewings and not reaching the black dots on the hindwings; these dots on the underside bear no metallic pupil; the female has very widespread fulvous marginal lunules on both surfaces; this race comes nearest to *orientalis*, Tutt, from Asia Minor, and I name it *TUSCANICA*; typical series from the Baths of Casciana, near Pisa. At Pertusola,

* *Plebeius aegon*.—G.W.

on the Gulf of Spezia, quite near the seashore, I collected in August a race consisting entirely of the unusual male form in which the black marginal border is very wide on the hindwings and quite absent on the forewings; females very dark, with lunules nearly obliterated on upper-side (race *LUNENSIS*). Finally, I must mention the race found by Querci on the Aspromonte range, in Calabria, at 1,200m.; it comes near the large *iberica*, Tutt, of Spain, by its size, ranging up to 28mm., and also by some specimens having a brilliant white underside, such as is common in Spanish races but rarely found in Italy, where the undersides are nearly always white, but of a duller tone; the black margin of the male is very wide and distinctly alpine; the lunules in females are very limited, and even absent; the premarginal black dots of underside have no metallic pupils, or very indistinct ones.

Plebeius idas, L.,* race *ALPOPHILA*, mihi, race *AUSTRALISSIMA*, mihi, and race *APENNINOPHILA*, mihi; subspecies *calliopis*, Bsd., race *CALLIOPIDES*, mihi.—True *idas*, as distinguished from *calliopis*, Bsd., which may be called a subspecies rather than a simple race, produces in Tuscany a mountain race and a race of the plains. The first is a transition to the alpine one, which Oberthür described well, but wrongly proposed to call *alsus*, Hüb., because the latter name was created by Esper and given to an *argus* of the race *philonomus*; I suggest to substitute it by *ALPOPHILA*, mihi.

The race of the Apennines, as shown by a large series of the Fegana valley, m. 500 (near Lucca), in my collection, belongs clearly to the *alpophila* mountain group by its distinctly brown underside, but it is less dark on both surfaces; the females have a limited blue area at the base of the wings on the upperside. The race of the plains of Central Italy has a white or light grey underside in the male; the colours are brighter in both sexes; the female has large orange lunules and the premarginal black spots of upperside are elongated as in *nevadensis*, Obth., from Spain; specimens with no blue scaling are common; it measures 25-28 mm. in expanse, whilst *APENNINOPHILA*, just described, measures 23-25 mm.; I propose the name *AUSTRALISSIMA*, taking as type the race of the Tuscan coast (Forte dei Marmi).

Oberthür has shown that *calliopis*, Bsd., is a very distinct subspecies, if not a species, and that it has, like *idas*, a mountain race and a race of the plains; the former he figures on pl. xxxix. and xlii. of his *Ét. de Lép. Comp.*; a name being necessary to designate it, I should call it *CALLIOPIDES*. The Tuscan race which I have named *abetonica* is very similar to Boisduval's French race of the plains, although it flies at an altitude of 1,300 m.

In October a few very small weakly specimens of *idas* sometimes occur near Florence, evidently being precocious autumnal individuals of the first brood (*MISERA*, mihi.).

Lycaenopsis argiolus, L., race *CALIDOGENITA*, mihi, and race *BRITANNA*, mihi.—The nymotypical race is that of Northern and Central Europe, with two broods, the second of which has been well described by Fuchs under the name of *parvipuncta*. In Southern Europe there

* *Plebeius argus* (*argyrognomon*).—G.W.

are three broods, and the second and third are much more distinct from the first, not only by a greater constancy and prominence of the characters of *parvipuncta*, as described by Fuchs, but by their larger size and by the much greater extent of the black marginal band in the female; I should restrict the name of Fuchs to the second brood of Central Europe and name the southern second and third *CANICULARIS*, mihi. It must furthermore be noticed that also the first brood differs markedly in the south from the northern one by its larger size and warmer, less silvery, colouring, so that it is well worth distinguishing by the name of *CALIDOGENITA*.

The race of the British Islands varies in an exactly opposite direction, if I may be allowed to judge from a series of specimens collected in May at Woodford in Epping Forest; they are of an exceedingly bright blue, very cold in tone above; on the underside the blue basal suffusion is vivid and expands to an extent it does not reach even in the nymotypical northern race; the little black dots and streaks are much more prominent; I also notice a female form of the 7th of May, which certainly never occurs in the south; in this form the underside characters of the first brood mentioned above are associated with a very wide marginal black band on upperside, such as is only found in *parvipuncta* or *calidogenita* (female form, *MIXTA*, mihi.).

Cupido minimus, Fuessl., race *TRINACRIAE*, mihi.—Querci has collected in Sicily (S. Martin delle Scale, m. 700) in April and May a very distinct race of this species; it is the smallest known, never surpassing 18 mm. of expanse and frequently being as small as 14 mm.; there is never any trace of metallic scaling at the base of the wings on the upperside in either sex and the colouring is of a dull, greyish black, lighter than in other races.

Cupido sebrus, Boisd., race *ANGULOSA*, mihi.—A female I have collected in the mountains of Tuscany (Firenzuola, m. 500), and others collected by Querci in the Sibillini mountains (Piceno) are remarkable on account of the shape of the wings, the hindwings forming a distinct angle on the second cubital nervure; it is evidently a mountain character; the males are distinctly smaller than the usual ones of the plain and the black markings on the underside are more minute.

Everes alcetas, Hüb.—Seasonal dimorphism is not so marked in this species as in *argiades*, Pall., but the first brood is generally smaller and pale specimens occur, such as are never found in the second; the name *DIMINUTA*, mihi., seems appropriate to the former. Hübner states particularly that there is no trace of the orange lunules on the underside, so that specimens bearing traces of such lunules can be designated by the name *LUTEUMFERA*, mihi, although in the figure of that author they do exist.

Thecla (Nordmannia) ilicis, Esp.—Oberthür rightly observes that Staudinger has made a blunder in using the name *esculi* of Hübner for the aberration of *ilicis* in which the white streak on underside is missing, the figure of that author clearly representing another species; the name *ALINEATA*, mihi, can be substituted.

Thecla (Nordmannia) acaciae, Fabr., race ITALICA, mihi.—Courvoisier has shown that the nymotypical race is the oriental one, usually called *abdominalis*, Gerh.; he has called the western race *nostras*. The latter, however, includes more than one local race, and the Tuscan race is certainly very different from the more northern ones by its lighter and more reddish tinge on the underside and by the marked reduction and paleness of the whole pattern: white spaces, black streaks, and fulvous lunules.

Thecla (Klugia) spini, Schiff., race MINUTA, mihi.—Oberthür has given the name of *major* to the very large race from the Maritime Alps; in my Italian specimens from Chiot (Piedmont) and in the French ones from Moulinet, the pattern is also very conspicuous on underside and two or more fulvous patches exist on upperside of hind-wing. A specimen from the Aurunci Mountains, near Caserta, collected at 1,200 m., corresponds to the same race, but specimens found by Querci in the Sibillini Mountains (Piceno) at the same altitude are exactly opposite in character; they are small (24-25 mm.), very dark black on upperside, with only a faint fulvous patch at the tornus; all the pattern on underside is reduced in extent and pale; the white streaks strongly sinuous.

Bithys quercus, L., race INTERJECTA, mihi. The extreme variations of this species consist in the nymotypical northern race, and in *iberica*, Stdg., from Spain and Algeria. The race of Central Italy cannot be referred to either, as it is by its variations intermediate between the two, never reaching the most highly characteristic forms of either one or the other, the brownish underside of the former, with wide-spread blackish pattern and vivid orange lunules, or the pale pearly grey underside of the latter, with ill-defined pattern and yellow lunules; a distinctive name becomes, in consequence, necessary.

Gonepteryx rhamni, L., race *transiens*, Vrt., second gen. SECUNDA, mihi, and third gen. TERTIA, mihi. The second and third brood are different from the first, a fact which has not been sufficiently recognised; in both sexes the underside is often of a fine reddish ochre, most individuals being of a pale ochreous colour or pale greenish or white, when the reddish and greenish tinges are in such a proportion as to neutralize each other; in the first brood, instead, vivid green specimens are frequent and ochreous ones very scarce. Independently of seasonal polymorphism, I propose the names of VIRIDISSIMA, ALBESCENS, and OCHRACEA for the three extreme individual forms, which are also produced by the northern nymotypical race, and of which I possess British specimens.

(To be continued.)

NOTES ON COLLECTING, Etc.

TREACLE IN DECEMBER.—Having never previously treacled later in the year than early November, I tried the experiment on December 14th last—a very close evening—and treacled a few trees in the wood near at hand. These had been very productive earlier in the autumn, and I was interested to see if a warm evening, so late in the year,

would attract hibernating moths. The result was that *Scopelosoma satellitia* and *Orrhodia vaccinii* turned up in some numbers, but *O. ligula*, which had not put in an appearance until October 27th, had entirely vanished. These two were all, and there was not a single belated example of any non-hibernating species.

Hybernia defoliaria males were in countless numbers all over the leafless undergrowth in the wood, and mostly still in excellent condition, but whereas, six weeks earlier, *H. aurantiaria* and *H. defoliaria* had been present in almost equal numbers, now no *aurantiaria* were seen, not even a single worn one, although I searched for them very carefully. The only other species seen was *Cheimatobia brumata*, common, but not nearly so plentiful as *defoliaria*.

H. aurantiaria is evidently a short-lived species compared with *H. defoliaria*, which was plentiful in October, some ten days before *aurantiaria* put in its first appearance.—RUSSELL JAMES, Ongar Park Cottage, Ongar. February 5th, 1919.

SOME LEPIDOPTERA OF AN ESSEX WOOD.—Having taken a summer cottage near Ongar, I have had the opportunity of working one of the local woods.

In the little time at my disposal I have been much interested in noting the difference in the local fauna from that of Epping Forest, so near at hand.

My knowledge of the district is as yet somewhat superficial, but I have already come across a considerable number of species that I have never met with in a very long experience of Epping Forest. On the other hand, many of the Forest species are absent, although, of course, further research may remedy this deficiency.

Two of the most striking instances are *Boarmia roboraria* and *Lymantria monacha*. These may occur sparingly in the Forest, although unknown to me, but in my local wood the former abounds and the latter is quite reasonably common. *B. roboraria*, moreover, is an exceedingly interesting race, practically every specimen very dark, and the transverse markings largely obscured. Of all the specimens seen, only a single one—a male—was of the type form, and the numbers are astonishing.

On the first evening that I discovered their existence (June 23rd), I found seventeen males and two females sitting on oak trunks in the course of an hour, in one case three on a tree, and all in exquisite condition. They continued in these numbers for a week or so, and then quickly declined, the last occurring on July 4th; but only eight females in all.

Lymantria monacha is very late, and freshly emerged females were found on oak trunks as late as August 19th, and a full-fed larva on July 4th. The specimens are rather large and strongly marked, but not strikingly dark.

Another tree-trunk species not known to me in Epping Forest is *Acidalia inornata*, not at all uncommon, also *Lobophora halterata*, and earlier, a great abundance of *Tephrosia extersaria* and *Cidaria silaceata*. Among summer *Noctuae* taken, *Dicycla oo*, of course, is an Epping species, but as far as my knowledge goes, *Cymatophora or*, *C. duplaris*, *Orthosia suspecta*, *Noctua umbrosa*, and *Cleoceris viminalis* are not. I shall refer to these species later on, when dealing with treacle. The only

other species of special interest at this time was *Euchloris* (*Phorodesma*) *pustulata*, of interest because of its numbers. On several evenings it was in such abundance a little before dusk that half-a-dozen or more could be seen on the wing at once, but, as usual, nearly all were worn or faded, and I scarcely got a really good specimen out of the lot.

I was away most of August and early September, but the moths on treacle in the autumn again showed some marked differences from those of the Forest, in proportionate numbers perhaps, more than different species. For example, *Miselia oxyacanthæ*, which swarms in countless numbers on a good night in the Chingford section, was here almost a rarity. *Amathes* (*Anchocelis*) *pistacina* was also very scarce, but on the other hand, *A. helvola* (*rufina*), *Orthosia lota*, and *Hadena protea*, were common, and *Agriopis aprilina* occurred now and again. In the latter days of September, *H. protea* was quite the commonest moth. *Calocampa vetusta* occurred, but no *C. exoleta*, while in the Forest I have taken the latter, but no *vetusta*.

I did no larva-beating between May, when *Hylophila bicolorana* was so abundant, and the end of August, but on the last day of that month I did a couple of hours mixed beating with my boys. Although larvae were very plentiful, all might have been taken in Epping Forest except *Cymatophora or*, but scarcely in the same quantities. *Dasychira pudibunda* came down two or three at every beat, and were crawling all over the trunks. An occasional *Demas coryli* was among them. *C. or* was common on aspen, and other species that occurred in varying numbers were *Lophopteryx camelina*, *Notodonta dromedarius*, *Notodonta tremula* (*dictæa*), *Drepana hamula*, *D. lacertula*, *Hylophila prasinana*, *H. bicolorana* (very small), *Geometra papilionaria*, and many unidentified small Geometers, which were clapped into a large sleeve and left with a pot of earth inside, as I was going away next morning.

The great capture of the day, in the eyes of my two boys, however, was *Eumorpha* (*Choerocampa*) *elpenor*, six full-fed larvae of which were found on small willow-herb round a pond on the edge of the wood. From traces left, there must have been many more, the others probably gone down, as these commenced pupating at once.

Throughout July, and again in the autumn, I treacled in the wood and never without a certain amount of success. Of course, I had to be very sparing, but I made a 2lb. tin of golden syrup go a long way. The usual allowance was a tablespoonful well diluted with water, and a few drops of pear essence. This liquid was so thin that I feared it would soak in or run off the trees, but by avoiding mossy or lichen-covered surfaces, I managed to ration it out over 50 or 60 trees, and it proved quite attractive. Treacling once or twice a week, until I went away at the end of the month, always produced a fair sprinkling of moths, although never such numbers as came later, in October.

The best species were those previously referred to:—*Cymatophora or*, *C. duplaris*, *Dicycla oo* var. *renago*, *Orthosia suspecta*, *Noctua baja*, *N. umbrosa*, *Cleoceris viminalis*, *Triphaena fimbria*, and very dark *Boarmia repandata*.

I did not see many *repandata*, but all I saw were dark, none typical. *D. oo* only occurred one night, and the two specimens taken were var. *renago*, but *C. or* was in greater numbers than I have ever before seen anywhere, sometimes two and three on a tree, and continuing until the end of July. There must be a continuous emergence, as when I

started on July 5th, most were worn, and yet the last specimen on the 26th was quite fresh. After this date I treacled no more until September 18th, and then continued about twice a week until October 27th, and once more on December 14th as already recorded.

The only other species of interest taken besides those mentioned, were *Asphalia diluta* (not uncommonly in September), *Xanthia fulvago* var. *flavescens*, *Peridroma saucia*, and *P. suffusa*.

The quantities of *Orrhodia vaccinii* and *Scopelosoma satellitia* on some evenings were quite phenomenal. My small patches were much more than covered, the moths crawling over and knocking each other on to the ground. The wood is full of hills and hollows, and I always found that success depended much more on wind than warmth. Some very warm still nights were the poorest, while on windy ones, even when very cold, the moths swarmed.

The foregoing notes are, of necessity, very disjointed, as there has been little time at my disposal. But from what I have seen I am anxious to explore the district more thoroughly in the coming year, unhampered by war restrictions.

The wood in question is a large private one, mainly oak, with a very varied undergrowth, including a lot of birch and aspen, and in pre-war days somewhat strictly preserved for game. With a cottage on the spot, however, I have had no difficulty in gaining access.

I have never seen or heard of an Entomologist in the district, but should imagine I am on some of the historic ground worked by Doubleday, and probably the scene of his *Glyphisia crenata* capture.

Needless to say, this species has not turned up, but from the look of the place, I can well believe it holds many treasures as yet undiscovered.—RUSSELL JAMES, Ongar Park Cottage, Ongar. February 1919.

TREACLING IN 1918.—It is the ill-fortune of war that we appear to have had an exceptionally good treacling year in 1918, when the restrictions of light, and rationing, made the pursuit of this collecting method well-nigh impossible. With a little management and economy, however, something could be done, and I made small quantities of syrup go a long way. Besides finding moths whenever I treacled in my local wood, I had really first class nights on the only two occasions on which I tried in other districts.

The first of these was on June 20th, at Wyre Forest. I ran across for one evening when business had taken me to Wolverhampton. A farmhouse, which I knew to be the haunt of several Worcester collectors, not only gave me comfortable quarters, but supplied treacling ingredients in generous measure. Thus armed, I treacled my only really long round since rationing started, and happily the moths appreciated it. *Agrotis exclamationis* far outnumbered all other species put together, but among them were a nice lot of useful insects, the most conspicuous being *Aplecta tincta*, of which I took a long series in the loveliest condition.

Aplecta herbida was rarer, but *A. nebulosa* was abundant, strikingly pale in colour after my dark Ongar specimens. I was very surprised at the absence of *Cymatophora duplicaris*, *C. or*, and *C. fluctuosa*, the first-named usually very common, and even the last I expected in fair numbers on such a night. I remember Mr. A. J. Hodges taking, I

believe, 28 specimens in a single night on this actual ground. As it was, the only *Cymatophorid* to turn up was a fine *C. ocularis*, which was gratefully boxed. Other species out of the common herd that occurred not infrequently were *Acrionicta leporina* and *Hadena contigua*, and *Phaetrea runicis* was so common and fine that I was tempted to box a renewal series. There was nothing else of any rarity, but with series of those already named, and good forms and well-marked specimens out of the host of commoners, my supply of boxes soon gave out, and I had to return to the farm and kill my captures between rounds.

Just before putting on treacle, I took eight beautiful *Boarmia roboraria* from oak trunks (2 ♂ and 6 ♀), of a form paler than those from the New Forest, and therefore strikingly different from my dark Ongar specimens, taken a few days later.

My second evening was also snatched from a business trip to Leeds, when rather than spend the night in a hotel in that smoky city, I ran across to Warthill, just outside York, only in time to get a meal and put on treacle. I had about a quarter of a pound of golden syrup with me, and this I diluted with rum and water to such an extent that I managed a round of some 100 trees. I was afraid I had overdone it, as when I came to the end the first patches were practically invisible.

But the moths found them out all right, and from the first tree, I saw I was in for a good night of it. Thirty, forty, fifty and more moths were on and around every patch. I had about a hundred boxes with me, but with very poor killing facilities I had to pick my specimens carefully, and thus left hundreds that I would have gladly taken. The two outstanding species were *Orthosia suspecta* (eight and ten on a tree, but many worn), and *Cosmia paleacea*. I brought away 35 picked specimens of the latter and could have taken many more. Four beautiful *Aplecta occulta* were also very acceptable.

In striking contrast with Wyre Forest, *Cymatophora duplaris* was here perhaps the commonest moth, often twenty or more on a tree, but wanting much picking over. Both the dark unicolorous and typical forms, with intermediates, occurred, but the prevailing tendency was in the dark direction. Another most abundant species was *Calymnia trapezina*, from which I picked out one very striking variety, in colour a dull, dark brick-red, quite different from anything I have seen before, with the stigmata and transverse lines much paler. Another moth puzzled me at first. It was quite fresh and had a strange, yet somehow familiar, look. I eventually realised that it must be an abnormal second-brood specimen of *Apamea basilinea*—very small, dark and grey, but with quite the characteristic markings.

Three fine black *Xylophasia monoglypha* were taken and some mahogany-coloured *Triphaena fimbria*, shaggier and darker than our southern specimens, while late in the evening *Agrotis tritici* began to appear in some numbers, when my boxes were all full. I was sorry at having to leave these, but it could not be helped. *Cleoceris viminalis* occurred not very commonly, including one or two almost black, and such things as *Noctua baia*, *Caradrina taraxaci*, *C. alsines*, *Leucania pallens*, *L. impura*, and many others helped to swell a huge total. Among a few Geometers that appeared were two nice male *Epione parallelaria*. *Lophopteryx camelina* flew up to my lamp, and before

dark *Cynatophora duplaris* were flying down from the pines and birches in some numbers as I walked among them.

I was back in Leeds by 9 o'clock next morning, congratulating myself upon making the most of my opportunities, but regretting that an important engagement in London that night prevented my having another evening in the woods.—RUSSELL JAMES, Ongar Park Cottage, Ongar. February 5th, 1919.

RANDOM NOTES FROM NORTH-EAST IRELAND.—My battalion moved from Salisbury Plain to Belfast in early May of this year. I had anticipated some interesting collecting on the plain, and had already found larvæ of *Aretia caia* and *Cosmotriche* (*Odonestis*) *potatoria* abundantly. *Aglais urticae*, which was so common last autumn, had reappeared after hibernation and the females were everywhere ovipositing. The species must have been extraordinarily abundant in the larval stage in May and June.

The Belfast district is not a convenient centre for one whose entomological excursions have to be fitted in in the intervals of military duty. Moreover, it is one of the rainiest districts in the British Isles. May was delightful and the greater part of June also, but early in the latter month I fell a victim to the so-called "Spanish influenza," and in consequence many things, which should have been done in this month, particularly the collection of *Polyommatus icarus* and of the larvæ of *Euchloë cardamines*, were left undone.

I was surprised at the abundance of Lepidoptera generally compared with the North of England. *Euchloë cardamines*, for instance, I have never seen in such abundance as in the Newtownards district from May 20th to June 1st. The species was already worn on May 20th, and few useful specimens were obtained. One dwarf male 32mm. in expanse (centre of thorax to apex $\times 2$) is perhaps the most interesting. (C. Down, April 29th, 1918.) Ova and young larvæ were abundant on *Cardamine pratensis*, and I saw none on any other food-plant. *Sisymbrium alliaria* does not occur in the district—at least, I have never seen it. The presence of six ova on one plant of *C. pratensis* (Newtownards, April 29th, 1918), suggests at once a sound economic foundation for the cannibalistic habits of young larvæ of this species, and an explanation of the prevalence of dwarfed specimens.

The three common Pierids, *P. brassicae*, *P. rapae*, and *P. napi* all occurred freely throughout the summer; the first brood of *P. rapae* and the second of *P. napi* producing fine forms.

The only Argynnid observed was a solitary *Argynnis aglaia*, at Ballykinlar, on the coast of Co. Down, on August 10th.

Larvæ of *Aglais urticae* swarmed on every suitable patch of nettles in May and June. The pupæ were much infested with the small Chalcid parasite and imagines were not common. I bred a good number—all large, brightly coloured examples, not differing in any way from South of England forms. *A. urticae* in England appears to be continuous brooded in a sense. Larvæ could be found last year towards the end of September, which were certainly a third generation. In Ireland I searched for the second-brood larvæ about three weeks after the appearance of the first-brood imagines, but none appeared. The imagines first appeared on June 25th, and were well out early in July. No larvæ were seen in July, or early August, and in the places

where spring larvæ has been abundant I found none. Only two broods were observed, one at Malone, Belfast, on August 25th, half-grown, and the other at Ballykinlar, Co. Down, on September 4th, also half-grown. These were both reared. I doubt very much if any would have survived in nature. Torrential rains lasting nearly a fortnight set in before they were full-fed, and one or two frosts occurred during the pupal stage. In all I reared 42 imagines from these pupæ during October.

The imagines of the Malone brood emerged from October 8th-19th. By the end of this time it was necessary to place the box containing them near the fire before the imagines would emerge. No tendency to *ab. polaris*, nor, with two slight exceptions, to *ab. nubilata*, was observed, though I had expected this with some confidence. In three specimens aberrational marking of one forewing, apparently due to pupal injury, was noted, and five very pale forms of a "washed" out appearance emerged, three of which were cripples. There were thirty specimens in this brood. The Ballykinlar brood produced twelve specimens remarkable for a tendency of the ground colour to replace the usual yellow markings and suppression of the blue marginal spots. In one specimen the yellow areas are, however, considerably extended. *Pyrameis cardui* and *P. atalanta* occurred sparingly in May and at the end of August.

The *Satyridæ* were very interesting. The first observed were *Pararge megera* and *P. aegeria*, on May 19th, in perfect condition. *P. megera* soon disappeared, and a second brood appeared in August. The life cycle of *P. aegeria* is more puzzling. I give dates and notes of captures:

April 19th, 1918, Newtownards, 2 ♂, light form, fresh condition.

April 29th, 1918, Newtownards, both sexes, worn.

June 5th, 1918, Belfast, 1 ♂, light form, fresh condition.

July 4th, 1918, Belfast, 2 seen, worn.

July 17th, 1918, Belfast, 1 ♀, light form, fresh.

July 28th, 1918, Belfast, several seen, apparently fresh.

July 30th, 1918, Belfast, 1 ♂, light form, worn (slightly).

August 25th, 1918, Dunmamy, several ♂ s, dark form, fresh.

September 4th, 1918, Ballykinlar, ♂ s and ♀ s, dark form, fresh.

The Ballykinlar specimens include a ♂ which is the darkest specimen of the species I have seen, the yellow spots being almost completely obsolete.

Epinephele jurtina (ianira) was common in July and August, and I obtained several nice females with additional spots on forewing-underside. *Aphantopus hyperantus* occurred in some numbers from July 4th onwards. The specimens are much lighter in underside ground colour than South of England forms and approximate to the Cumberland form referred to and figured in South's *Butterflies of the British Isles*. *Hipparchia semele* was common and well marked. I observed a ♂ attempting to pair with *E. jurtina* ♀. There were two broods of *Coenonympha pamphilus* and of *Rumicia phlaeas*—I obtained no striking forms of either species.

Polyommatus icarus first appeared on June 1st, on which date a fine large ♂ *ab. nigromaculata* (= *celina* ?), was secured. Large and well-marked ♀ s occurred in June, and then only wasted specimens in July and August.

About the end of August and early September fresh specimens again occurred, smaller and less strongly marked. I had been under the impression that *P. icarus* was single-brooded in the north of Ireland, but these facts seem to point to at least a partial second brood. I saw no other "blues" and no "skippers."

I had little opportunity of collecting moths. *Arctia caia* was frequent in the larval state and a nice ♂ form was bred from a Belfast larva. *Spilosoma menthastris* and *Diaphora mendica* occurred freely in the larval state in September. The imagines of *S. menthastris* in May were of a creamy tint. I reared a brood of *D. mendica* larvæ from a Belfast ♀ which are now in the pupal state, and I have not yet seen the ♂ form in the district. *S. lubricipeda* was not met with in any stage. Some few *Noctuae* were obtained which await identification. (I regret to say I know practically nothing of this group).

Among the Geometers the most interesting were *Xanthorhoë fluctuata* and *Boarmia repandata*. Of the former a lovely melanic form occurred, the most extreme specimen being of a uniform dark grey, with whitish veins and subterminal line, the usual markings being present. The hindwings are uniform dark grey, the usual transverse lines being very faintly indicated. The specimens form a pleasing contrast to a very light form taken on Salisbury Plain in April. The *B. repandata* are a very dark mottled form. One uniform dark grey specimen was also obtained.

Among other *Geometrae* obtained were *Hydriomena furcata* (*Hypsiopes elutata*), *Opisthograptis luteolata* (*Rumia crataegata*), *Lozogramma* (*Panagra*) *petraria*, *Xanthorhoë* (*Melanippe*) *montanata*, *Cidaria fulvata*, *Dysstroma citrata* (*C. immanata*), *Lygris testata* (swarming throughout August and early September among dwarf willow on the coast), *Malemydris* (*Larentia*) *didymata*, *Ochyria* (*Coremia*) *unidentaria*, *Anaitis plagiata*, and *Ematurga atomaria*. All are quite common insects and quite ordinary forms. Certain things were not met with at all. *Oureapteryx sambucaria*, *Ennomidae*, etc., and only isolated specimens of *Abraxas grossulariata*.

Hepialus humuli occurred towards the end of June, the males being quite of the southern form.

Zygaena filipendulae cocoons were obtained in Belfast and Co. Down in early June and again on the Down coast in August, the imagines showing a tendency to confluent spotting. In the earlier specimens this confluence chiefly affected the outer two spots, and in the later specimens the central areas. In August I found two specimens in a lonely spot on the Co. Down coast impaled on the marram grass.

The "Micros" are not yet identified.

A few notes of a more general nature may be of interest. In July I reared a great number of *Arctia caia* from Salisbury larvæ. Among these were two or three rather interesting varieties and about a dozen extreme forms—all crippled. These included two with black hindwings; one with the white markings light brown, one hindwing black the other normal; two or three with hindwing markings all united into a blotch; one with all wings cream-coloured, without any markings; one in which one forewing had the white and brown distributed in a very abnormal manner; and one with forewings suffused. All these insects were very weak and some scarcely able to crawl about,

leaving little doubt that disease was the cause of the variation in marking. On July 27th, while removing dead pupæ from a box I accidentally cracked one and found it contained a living moth. I then removed the pupa case entirely and the moth, a large ♀, after sitting still for some hours, developed its wings in the normal manner.

On July 22nd I put several specimens in a large box with a muslin cover, to obtain a pairing. In the morning two were paired, so I removed them to another box. They remained united till 8 a.m. on July 30th, when I "killed" them and sent them to the Rev. C. R. N. Burrows for examination. They reached him *alive*, but still united, and having been "killed" by him a second time, were still united when I last heard of them.

On July 15th I watched *Euproctis similis* emerge. The effort required to escape from the pupa and cocoon was very great. Escape was achieved by a series of revolving movements of the abdomen, the legs not assisting in any way. The process occupied some twenty minutes, and the insect then crawled to a suitable position, where it rested for some time before development begun. Development was not rapid but progressed evenly. This insect, and *Arctia caia*, which develops its wings very slowly indeed, formed a remarkable contrast to *Aglais urticae*, which has usually completed the process within two or three minutes of emergence.—HAROLD WILLIAMS.

NOTES ON LEPIDOPTERA IN 1918.—After collecting the Macro-lepidoptera in Chiswick for over forty years, it was somewhat surprising to be able to add three species, new to the local list, this last summer. On July 28th I found a larva of *Notodonta dromedarius* on a birch in the garden, and my brother took another a few days later. One of these was bred a month later. Early in August, a larva of *Acronicta leporina* occurred on birch, and my brother took larvæ, also on birch, of *Drepana lacertinaria* and *D. falcataria*, the first being new, but the second is certainly an old inhabitant of Chiswick, as I took it in 1878. Hitherto, I have not connected *Pyrausta aurata* with suburban kitchen gardens, but on July 23rd I saw four or five flying over thyme and marjoram flowers in the hot sun, and some days afterwards, I saw another on a large ox-eye daisy in the flower garden. From three larvæ taken off hop, three imagines of *Hyppena rostralis* were bred, and all were ab. *variegata*, Tutt. On August 10th, when strolling along some allotment gardens, I watched a ♀ *Pieris napi* ovipositing on some plants of *Lepidium sativum* (Cress) which had been allowed to run to seed. On the 13th, I noticed some *Laspeyresia* (*Semasia*) *ianthinana* flying over hawthorn bushes, and was fortunate to see a ♀ ovipositing on the red haws. She laid one egg on the upper part of the berry, just under the calyx, and a second at the base of another berry, near the stalk. The eggs were thus simply attached to the outside of the haw. Crossing the river one morning to Barnes, I found *Hedya aceriana* abundant and in fine condition, several were drying their wings after emergence, on the trunks of black poplars. One *H. neglectana*, and one *Eucosma* (*Antithesia*) *salicella* were also obtained. The last hunt of the year occurred on Wimbledon Common, September 3rd. A few *Epiblema* (*Paedisca*) *solandriana* were found at rest on birch and buckthorn, and a nice *Pandemis* (*Tortrix*) *corylana* was taken on the wing. On a heathy spot, *Euxanthis* (*Eupoecilia*) *angustana* was flying freely, but most of them were worn.

On August 21st, I spent a few hours on Hayling Island, Hants, in the hopes of obtaining imagines of *Acroclita* (*Paedisca*) *consequana*, but of this I saw nothing whatever, nor did I find any plants of spurge. When on the island in 1889, I saw plenty of spurge, but at that time gave no heed to Microlepidoptera. I must have gone to the wrong side of the island this time. *Satyrus semele* was abundant about the grassy patches on the shingle, and *Anaitis plagiata* was common on fences; a few other common species were observed. The shingly scrubland, the marshy flats, and some of the lanes, looked as though they would yield good things if worked. My son had previously sent me a box of privet shoots, containing larvæ. From these I bred a series of *Cacoecia* (*Tortrix*) *podana*, and of *Pandemis* (*T.*) *heparana*, also two *Gracilaria syringella*.—ALFRED SICH. February, 1919.

CURRENT NOTES AND SHORT NOTICES.

The *Entomologist* for January contains (1) "Rhopalocera of the Lys Valley, N. France," by Capt. Mann and Capt. Eveleigh. (2) "Hemiptera-Homoptera taken in the New Forest," by G. T. Lyle, F.E.S. (3) The completion of the List of British Noctuae. (4) "The Season's Collecting in the Alpes Maritimes," by C. E. Morris.

In the *Can. Ent.* for December, is an account of the practical results in Spraying a Commercial Orchard for Green Apple Bug, *Lygus communis* (Hem.), in which it is shown that "the quality of the fruit has generally been better than the average," after spraying for apple scab (Coccids), etc., but after 1917, when the systematic spraying for apple bug was begun, "the crop in the orchard was 406·9 % of the crop of the previous year," which had been a lean one owing to the increasing infestation.

At the meeting of the Entomological Society of France, on December 11th, a report of the Committee was read, in which it was proposed to bestow the "Constant Award" for the year 1917 on the famous myrmecologist, M. J. Bondroit, for his work, "The Ants of France and Belgium.

With the commencement of the fifty-first volume of the *Canadian Entomologist*, the size of the page is enlarged and made uniform with that of the Annual Report, and of the Ontario Government Bulletins. This will be more suitable for full-page illustration. The number of pages will be somewhat reduced, and the June and July, and the August and September numbers will be issued together respectively. This custom of issuing two months' issues in one is being followed by a number of magazines. Our own did so last year, more than once, and it is intended to do this again this year, especially in view of the doubled postage generally necessary still.

It is intended to issue the *Scott. Naturalist* in bi-monthly parts until further notice, each number containing 32 pages.

In the *E. M. M.* for February, is an article on Collecting in South Devon, "A Lepidopterist's Retrospect," being an account of the work of two field entomologists during the past twenty-five years. Mr. C. G. Champion continues his descriptions of Exotic Coleoptera, this time the genus *Dianous* from India and China.

In the *Ent. News* for February, is recorded a "Swarming of the Monarch Butterfly *Anosia archippus*" (wrongly called *plexippus*, which

is white-banded, see Linn). This occurred near Vinton, Iowa, on September 8th, 1918. The region is hilly, with a few white oak-groves here and there, on and around which the individuals, some hundreds in number, were congregated. They seemed to be settling for the night, flying aimlessly in no definite direction. Time about 6 p.m., atmosphere cloudy, with little or no breeze.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

September 12th, 1918.—LARVÆ OF *L. aurita* (HOM.).—Mr. Ashdown exhibited series of the Homopteron *Ledra aurita*, with living larvæ. Some females had the frontal horns more developed than in the males.

SYMBIOSIS OF ANT AND BEETLE.—Mr. Blair, two very similar beetles, *Coccinella distincta* and *C. septempunctata*, the former associated with ants, and pointed out their differences.

SUCCESSIVE BROODS OF *D. truncata*.—Mr. Bowman, four successive broods of *Dysstroma* (*Cidaria*) *truncata*: (1) An average wild female; (2) including the yellow clouded and dark suffused forms; (3) more or less typical, October and November; (4) also more or less typical. (3) and (4) quite as large as the parent.

MICRO-LEPIDOPTERA.—Mr. Sich, the Micro-lepidoptera *Cacoecia podana* ab. *suberiana*, bred from ivy; *Pandemis ribeana*, with very faint markings: *P. heparana*, a dark specimen bred from rose; *Enharmonia woerberiana*, a dark specimen, Bath; *Acalla contaminana*, the aberrations *ciliana* and *rhombana*, and the form which has been provisionally named *omicron*.

ABERRATION OF *A. medon*.—Mr. Barnett, a series of *Arivia medon*, one underside striated on the forewings, Chipstead.

ABERRATION IN *N. tages*.—Mr. B. W. Adkin, a series of *Nisoniades tages*, some finely marked varied females, and a remarkable khaki-coloured form.

ABERRATIONS OF *A. grossulariata* AND OF *A. caja*.—Mr. Sperring, eight specimens of *Abraaxas grossulariata* from Aberdeen, bred, graduations of the dark suffused local race, and two very dark ones bred from suburban taken larvæ, also the ab. *fulvapicata* from S.E. London. Mr. Sperring also showed ten specimens of *Arctia caja* bred this year from S.E. London, including aberrations with orange hindwings, predominance of white on forewings, a banded form (hind), a banded form (fore), specimens much suffused.

ABERRATIONS OF *A. coridon*.—Mr. F. B. Carr, series of *Royston Agriades coridon*, 1918, including ab. *roystonensis*, ab. *semisyngrapha*, and specimens close to ab. *syngrapha*, with several underside aberrations.

LARVAL CASES OF A COLEOPHORID.—Mr. Dennis, heads of the common rush on which the very young larvæ of *Coleophora caespititiella* had, since the heads were gathered, made their cases.

JAPANESE RHOPALOCERA.—Mr. H. Moore and Mr. H. J. Turner, a large number of Japanese Rhopalocera.

PAPER.—Mr. Turner read a short paper, "Notes on the Butterflies of Japan."

REPORTS.—Reports on the season were given. The broom was flowering again, butterflies were scarce in Essex, remarkable aberrations

had turned up in the New Forest, *Pararge megera* second brood was common locally, and *Epinephele tithonus* was plentiful.

September 26th.—DECEASE OF A MEMBER.—The decease of Mr. W. de Visimes Kane was announced.

SAWFLY OF THE ALDER.—Mr. Main, for Mr. Carr, mines of *Phyllotoma vagans* (Sawfly) in alder leaves from Blackheath.

SECOND BROOD OF *S. LIGUSTRI*.—Mr. Moore, specimens of a second brood of *Sphinx ligustri*; August and September emergence.

LIVING *D. CIRCUMCINCTUS*.—Mr. Main, living examples of *Dytiscus circumcinctus*, a water-beetle, without secondary sexual characters.

GALLS.—Mr. Bunnett, galls of *Rhodites eglanteriae* and *R. rosae*, gall-flies.

THE "FIRE-BEETLE."—Mr. West, examples of the "fire-beetle," *Melanophila acuminata*, from Crowthorne.

ABERRATION OF *P. MEGERA*.—Mr. B. W. Adkin, aberrations of *Pararge megera*, with large ocelli, with small ocelli, with suffused area between central lines, from Dartmoor.

EXHIBITION OF LANTERN SLIDES.—The remainder of the evening was devoted to the exhibition of lantern slides.

Mr. Main, slides showing resting positions of native species of Mosquitoes and Gnats.

Mr. Bunnett, slides of many species of fungi.

Mr. Dennis, slides of numerous British grasses showing fructification.

October 24th.—DEATH OF A MEMBER.—The decease of Lieut. J. Bateson, who was killed in France, was announced.

ABERRATION OF *C. OCULARIS*.—Mr. Bowman, a nearly jet black *Cymatophora ocularis* from Chingford..

ABERRATION OF *G. PYRENAEUS* (COL.).—Mr. W. J. Ashdown, *Geotrupes pyrenaicus* from Surrey with a fine bronze-tinted aberration.

EXHIBITION OF *E. TITHONUS*.—Rev. G. Wheeler, Rev. A. T. Stiff, Mr. Sperring, Mr. Buckstone, Mr. Leeds, Mr. Frohawk, Mr. Turner, etc., series of *Epinephele tithonus*.

PAPER.—Mr. Wheeler read a paper, *The Variation in Epinephele tithonus*.

November 14th.—NEW MEMBER.—Mr. Clifford Craufurd of Watford was elected a member.

LECTURE.—Miss G. Lister, President of the Essex Field Club, gave a lecture on "The Mycetozoa," illustrating her remarks with a large number of specimens and coloured drawings of the species representative of the sections and chief genera of the group, with a large number of lantern slides. There was an interesting discussion.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.

October, 1918.—The opening meeting of the session was devoted to exhibits which were as follows:—

Mr. F. N. Pierce, a very dark example of *Tephrosia biundularia* var. *delamerensis* from Abbott's Moss, and a large number of Micro-lepidoptera. Mr. R. Wilding, *Vanessa urticae*, including a banded variety, *Argynnis aglaia*, *Brenthis euphrosyne*, *B. selene*, *Gonepteryx rhamni*, and

Nisoniades tages, from Cartmel, Lancs. Mr. S. P. Doudney, *Dryas paphia*, and var. *valesina*, also a xanthic male with bleached hindwings and a female with one hindwing much smaller than the other, *Limenitis sibilla*, *Zygaena meliloti*, *Gnophos obscuraria*, and *Hyria muricata*, all from the New Forest; *Brenthis euphrosyne*, *Numeria pulveraria*, *Hemerophila abruptaria*, and *Notodonta trepida*, from Burnt Wood, also a very dark aberration of *Arctia caia* bred from a larva found at Huyton. Mr. J. W. Griffin, nice series of the following:—*Bombyx rubi*, *Taeniocampa opima*, and *Orthosia upsilon*, from Wallasey; *Sphinx ligustri*, *Mimas tiliae*, *Arctia villica*, *Psilura monacha*, and *Catocala nupta*, from various localities. The Rev. F. M. B. Carr brought *Polygonia c-album* from the Mold district, *Taeniocampa opima* from Frodsham, and the following from Delamere:—*Abraxas sylvata* (*ulmata*) a long series, and *Eupithecia coronata*; he also showed *Plusia moneta* and stated that this year he had found the larva in his garden at Alvanley. Mr. W. Mansbridge showed the following from N. Staffs:—*Hesperia malvae*, *Nola confusalis*, *Bomolocha fontis*, *Tephrosia biundularia* var. *delamerensis*, *T. luridata*, *Boarmia repandata*, very dark forms, *Eurymene dolobraria*, *Lobophora halterata*, and var. *zonata*, and *Eupithecia debiliata*, from W. Yorks, *Odontopora bidentata*, some very yellow specimens, also *Boarmia repandata* var. *nigra*, from Knowsley, and *Platyptilia ochrodactyla* from Co. Durham. Mr. H. B. Prince, several boxes of Lepidoptera from localities adjacent to Liverpool. Mr. Leonard West had on view some beautifully drawn plates of various aquatic larvæ.

November 18th, 1918.—NEW MEMBERS.—Messrs. Edward Whitley, Ashleigh, Greenbank Drive, Liverpool; S. Gordon Smith, Brantwood, Dee Banks, Chester; and Alfred Newstead, Grosvenor Museum, Chester.

ABERRATIONS OF *P. HASTIANA*.—Mr. W. Mansbridge brought his series of *Peronea hastiana*, comprising most of the named forms and some unnamed; he also showed the varieties bred this season, these included vars. *mayrana*, *leucopheana*, *radiana*, *divisiana*, *centro-vittana*, and *autumnana*, and stated that *mayrana* was the most frequent, the others being only of rare occurrence.

MICRO-LEPIDOPTERA.—Mr. W. A. Tyerman showed bred series of *Hyponomeuta euonymellus* and captured *Semioscopus phryganella* from localities in the Liverpool district.

LOCAL RACES.—Mr. S. P. Doudney, *Odontopora bidentata* from Rainhill and Delamere, also the local race of *Euproctis* (*Liparis*) *similis* with brown anal tuft from Huyton.

THE BIRCH HEMIPTERON.—Mr. H. M. Hallett exhibited the Pentatomid bug, *Acanthosoma haemorrhoidalis*, usually considered to be attached to birch, but these had been captured a long way from the nearest birch.

COLEOPTERA LOCALLY NEW.—Mr. R. Wilding had a large number of Coleoptera from Cartmel, and called attention to the following as being new to the Lancashire and Cheshire list, viz.:—*Philonthus lucens*, *Silpha nigrita*, and *Scaphidium 4-maculatum*; he further included in his exhibit a very fine series of varieties of *Rhagium bifasciatum* from the same locality.

Subscriptions for Vol. XXXI. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 [This subscription includes all numbers published from January 15th to December 15th, 1919.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Ten Shillings, and must be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14. Cheques and Postal Orders should be made payable to H. E. PAGE.

ADVERTISEMENTS of Books and Insects for Sale, or Books wanted will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14

Subscribers who change their addresses must report the same to Mr. H. E. PAGE "Bertrose," Gellatly Road, New Cross, London, S.E., otherwise their magazines will probably be delayed.

Articles that require Illustration are inserted on condition that the author defrays the cost of the illustrations.

All Foreign Exchange Magazines must be forwarded to H. J. TURNER 98 Drakefell Road, New Cross, S.E. 14

Duplicates.—**Dissimilis*, *Velleda*, *Fibrosa*, **Ambigua*, *Fulva*, **Lubricipeda* var. *Fasciata*, **Plantaginis*, *Coracina*, *Captiuncula*, *Mundana*, *Lutosa*, *Togata*, **Valerianata*, *Cilialis*, *Inquinateilus*, *Caledoniana*, *Variegana* vars. *Sauciana*, *Geminana*, *Cinerana*, *Brunnichiana*, *Schulziana*, *Congelatella*, *Occultana*, *Vectisana*, *Dorsana*, *Rusticana*, **Suboccelana*, **Strobilella*, *Nanana*, *Herbosana*, *Petiverella*, *T. corticella*, **Ecop*, *Fulvigutella*, etc. **Desiderata.**—Good *Pyrales*, *Tortrices*, etc.—*T. Ashton Lofthouse*, *The Croft*, *Linthorpe*, *Middlesbrough*.

Desiderata.—*Pieris napi*—spring and summer broods with exact data (localities and dates)—from all parts of the Kingdom, especially North of England and Scotland; *Parage aegeria* from Scotland, Ireland, and North of England—exact data needed. Will do my best in return or pay cash.—*G. T. Bethune-Baker*, 19, *Clarendon Road*, *Edgbaston*.

Duplicates.—*Varleyata* and other varieties of *Grossulariata*. **Desiderata.**—Good varieties and local forms. *Spilosoma urticae*, *Advenaria*, and other ordinary species to renew old series. Good *Tortrices* and *Tinea*e.—*Geo. T. Porritt*, *Elm Lea*, *Dalton*, *Huddersfield*.

Duplicates.—*Grossulariata* var. *lutea*, *lacticolor*, *varleyata*, *fulvaticata*, etc. **Desiderata.**—Other extreme forms of *Grossulariata*, or good vars. of *Diurni*.—*Rev. G. H. Raynor*, *Hazeleigh Rectory*, *Maldon*, *Essex*.

Desiderata.—*Euchloë cardamines* from Ireland; also types of *E. cardamines* from Switzerland, Italy, S. France; var. *turritis* (S. Italy), var. *volgensis*, var. *thibetana*, and of *E. gruneri*, *F. euphenoides*, *E. damone*, and any paleartic species of the genus. **Duplicates.**—*Loweia dorilis* and vars., a few minor vars. of *R. phlaeas* (British), and many British lepidoptera.—*Harold B. Williams*, 82, *Filey Avenue*, *Stoke Newington*, *N.*

Duplicates.—*A. coridon* vars., including semi-syngrapha, *H. Comma*. **Desiderata.**—*A. coridon* var. *Albicans* (Spanish) and var. *Hispana* (do.), and good butterfly vars., especially from Ireland.—*Douglas H. Pearson*, *Chilwell House*, *Chilwell*, *Notts*.

Duplicates (all Clydesdale).—*Ethiops*, *Selene*, *Icarus*, *Phlaeas*, *Hectus*, *Mundana*, *Perla*, *Fulva*, *Nictitans*, *Tritici*, *Chi*, *Boreata*, *Cambrica*, *Belgiaria*, *Immanata*, *Olivata*, *Tristata*, *Boreata*, *Mercurella*, *Angustea*, *Dubitalis*, *Ambigualis*, *Truncicolella*, *Drepanitalis*, *Kuhmella*, *Fusca*, *Margaritellus*, *Hortuellus*, *Hyemana*, *Phryganella*, *Ferrugana*, *Solandrinana*, *Sponsana*, *Conwayana*, *Stramineana*, *Rivulana*, *Urticana*, *Octomaculana*, *Perlepidana*, *Vaccinana*, *Geminana*, *Herbosana*, *Myllerana*. **Desiderata.**—Numerous, especially.—*A. A. Dalglish*, 7, *Keir Street*, *Glasgow*.

Duplicates.—*Janira*, *napi*, *cardamines*, *Artemis*, *P. interrogationis*, *P. festucae*, *P. bractea*, *D. conspersa*, *Haslata* (all Irish). **Desiderata.**—*Machaon*, *Artemis* (English), *Cinxia*, *Athalia*, *Cardui*, *Galatea*, *Epiphron*, *Lucina*, *Actæon*, *Sylvanus*, *Comma*. All perfect, well set on black pins.—*Charles Langham*, *Tempo Manor*, *Co. Fermanagh*, *Ireland*.

CHANGE OF ADDRESS.—*H. C. Efflatoun*, *The College*, *Wye*, *Kent*.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. 1919, March 19th; April 2nd; May 7th.

The South London Entomological and Natural History Society, *Hibernia Chambers*, *London Bridge*.—*Meetings*: The second and fourth Thursdays in the month at 7 o'clock.—*Hon. Sec.*, *Stanley Edwards*, 15, *St. German's Place*, *Blackheath*, *S.E. 3*.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society).—Hall 20, *Salisbury House* *Finsbury Circus*, *E.C.* The First and Third Tuesday in the month, at 7 p.m. Visitors invited. *Hon. Sec.*, *J. Ross*, 18, *Queens Grove Road*, *Chingford*, *N.E.*

Communications have been received or have been promised from Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, C. P. Pickett, Parkinson Curtis, H. Donisthorpe, A. Sich, Dr. Verity, C. W. Colthrup, Rev. C. R. N. Burrows, Dr. T. A. Chapman, Capt. Burr, G. T. Bethune-Baker, E. B. Ashby, P. A. H. Muschamp, J. H. Durrant, Orazio Querci, Capt. P. P. Graves, Rev. F. D. Morice, H. W. Andrews, W. Daws, Lieut. Box, with Reports of Societies and Reviews.

All MS. and editorial matter should be sent and all proofs returned to Hy. J. TURNER, 98, Drakefell Road, New Cross, London, S.E. 14

We must earnestly request our correspondents NOT to send us communications IDENTICAL with those they are sending to other magazines.

Lists of DUPLICATES and DESIDERATA should be sent direct to Mr. H. E. Page, Bertrose, Gellatly Road, New Cross, S.E. 14

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

**H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.**

Full List of Ova, Larvæ, and Pupæ, also Lepidoptera, Apparatus, Cabinets etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

WANTED.

A good, second-hand INSECT CABINET, 20-40 drawers.—H. H. CORBETT, 3, Thorne Road, Doncaster.

G. A. Bentall, F.Z.S.,

~ NATURALIST ~

Carton Store Boxes, $15\frac{1}{2}'' \times 10\frac{1}{4}'' \times 2\frac{1}{8}''$, wood sides, hinged lid, covered dark leather paper, lined white inside, prepared cork bottom lining, 3/- each, carriage 6d. extra.

Dustproof white wood double Store Boxes, camphor cells, lined cork top and bottom.

$10'' \times 8'' \times 3''$

$14'' \times 12'' \times 3''$

$17'' \times 12'' \times 3''$

7/9

9/6

10/9 each.

ready end of month.

in stock.

Prepared Cork Sheets, $12'' \times 6''$, 4/6 per doz., 5d. per sheet.

Strong Glass Killing Bottles, fitted with cork bung, 2/- each. Larger size, 2/6 each.

White Tiffany (soft finish) for sleeving, etc. 30'' wide, $10\frac{1}{2}d.$ per yd.

A large stock of **British, Continental, and Exotic Lepidoptera.**

Cheap Type Collections.

Entomological Pins, from 1/3 per oz.

Tracing Paper for setting, $30'' \times 20''$, $3\frac{1}{2}d.$ per sheet.

23 only, small glazed **Exhibition Boxes**, 1/- each.

60 cork **Setting Boards**, 6d., 9d. and 1/- each.

ALL GOODS CARRIAGE PAID OVER 20/-.

Price Lists post free on request.

DUDLEY HOUSE, SOUTHAMPTON ST. (opposite Hotel Cecil),
STRAND, W.C. 2.

Subscriptions for 1919 (10/- post free) should be sent to H. E. Page, "Bertrose,"
Gellatly Road, S.E. 14.

Vol. XXXI.

No. 4.

13,820

The Entomologist's Record AND Journal of Variation

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.

GEORGE T. BETHUNE-BAKER,

F.Z.S., F.L.S., F.E.S.

M. BURR, D.SC., F.Z.S., F.L.S., F.E.S.

(REV.) C. R. N. BURROWS, F.E.S.

T. A. CHAPMAN, M.D., F.R.S., F.E.S.

JAS. E. COLLIN, F.E.S.

H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

JOHN HARTLEY DURRANT, F.E.S.

ALFRED SICH, F.E.S.

(REV.) GEORGE WHEELER, M.A., F.E.S.,

and

HENRY J. TURNER, F.E.S.,

Editorial Secretary.

CONTENTS.

	PAGE.
Collecting in several places in 1916-18, <i>Major P. P. Graves, F.E.S.</i>	61
The various modes of Emergence and the number of Annual Broods of the Grypocera and of the Rhopalocera of Southern Europe, <i>Dr. Roger Verity</i>	36
Notes on the Season 1918 from East Tyrone, <i>Thos. Greer</i>	72
NOTES ON COLLECTING :— <i>T. viridana</i> and <i>H. defoliaria</i> at Leatherhead, <i>C. W. Colthrup</i> ; Paired Lepidoptera in Flight, <i>Id.</i> ; Second Brood of <i>A. grossulariata</i> , <i>Id.</i> ; <i>Tubulifera</i> from Leicestershire, <i>Lieut. L. A. Box</i>	75
CURRENT NOTES AND SHORT NOTICES	76
SOCIETIES :—The South London Entomological Society	76
REVIEW	79
SUPPLEMENT. (Completion not yet received.)	

APRIL 15th, 1919.

Price ONE SHILLING (NET).

Subscription for Complete Volume, post free

(Including all DOUBLE NUMBERS, etc.)

TEN SHILLINGS.

TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,

"BERTROSE," GELLATLY ROAD, NEW CROSS, S.E. 14.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/5, 2/2, 2/6, 3/2. Folding Nets, 3/9, 4/3, 4/9. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 7d., 10d., 1/2, 1/10. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 9d. per four dozen, 1 gross, 2/-. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/7 per tin. Store-Boxes, with camphor cells, 2/3, 2/9, 4/-, 4/6, 5/6, 6/8. Setting-Boards, flat or oval, lin., 6d.; 1½ in., 8d.; 2 in., 10d.; 2½ in., 1/-; 3½ in., 1/4; 4 in., 1/6; 5 in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 10/6, 12/9; corked back, 15/9. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/9, 4/6, 5/6, 8/3. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/9 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, 1/2 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/6. Glass-top and Glass-bottomed Boxes, from 1/3 per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d., 1/-; Blowpipes, 4d., 6d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families and for all insects liable to become greasy.

We stock various sizes and lengths of these Silver Pins which have certain advantages over ordinary entomological pins (whether enamelled black or silver or gilt).

NESTING BOXES of various patterns which should be fixed in gardens or shrubberies by lovers of birds before the breeding season.

SHOW ROOM FOR CABINETS

Of every description for INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS &c.

Catalogue (84 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic),
Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour-Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.

Bexley

L. W. NEWMAN

[Kent]

Has for sale a superb stock of 1918 specimens in fine condition, including Varleyata; Bicuspis; Pendularia var. Subroseata; Melanic forms Lariciata, Consortaria, Consonaria, Abietaria; Irish forms Aurinia and Napi, fine vars. Tiliæ, Yellow Dominula, etc., etc. Quotations and Insects sent on approval with pleasure.

Also a huge stock of fine PUPÆ and OVA.

Write for latest price lists.

NOTICE:—Owing to huge rise in cost of metal, etc., my **Relaxing Tins** are now **3/6** small and **5/6** large, post free.

GALLS AND PIERCED BRAMBLE AND BRIER STEMS.—Mr. L. A. BOX would be very grateful for any sorts and quantities, with localities, from all parts of the United Kingdom.
80, Northampton Road, Croydon.

Collecting in several places in 1916-18.

By MAJOR P. P. GRAVES, F.E.S.

(Continued from page 8.)

SOUTH PALESTINE.

From the beginning of July to August 21st, 1917, I was at Deir el Belah in S. Palestine, the Headquarters of the force which was holding the Gaza sector of our front. Butterflies were rare here. The country, which is open grassland with a few trees in the neighbourhood of the villages, was very burnt, and the soil had crumbled into dust under heat and the impact of an immense amount of motor transport, not to mention the trampling of thousands of feet and hoofs.

A small migration of *Belenois mesentina* was taking place when I arrived, early in July. Daily, a few males and fewer females of this species flew along the cliffs from north to south, never, as far as I could see, returning. The time of flight was from 11 a.m. to 3 p.m. A single *Colias edusa* was the only other Pierid I saw here. A few *Pyrameis cardui* were observed, and I found a few—a very few—*Polyommatus icarus* of very southern summer form, two *Rumicia phlaeas* g. a. *eleus*, and two very ordinary *Gegenes nostrodomus*, in a fig orchard about $1\frac{1}{2}$ mile south of Deir el Belah village. Close to the village, *Zizeeria karsandra*, *Tarucus balcanicus*, and *Erynnis alceae* g. a. *australis* were taken. The only Odonata seen were an *Orthetrum* resembling *O. chrysostigma*, and a *Sympetrum*, which I took to be *S. meridionale*. Both were rare. A visit to Khan Yunus—a village with copious wells, extensive plantations, and a dank summer heat—in August, gave me nothing new, but I noted that *Tarucus balcanicus* was pretty common here along the hedges in which were many *Zizyphus* trees and shrubs, both *Z. lotus* and *Z. spina-christi* occurring.

Late in August I moved to Umm el Kilab (Anglicè—Mother of Dogs!), about four miles from the Turco-Egyptian frontier at Rafa. This was my headquarters till December 30th. During November and December I was frequently absent, having work to do in connection with the advance. Umm el Kilab and Rafa were in a sandy steppe or veldt area. The political frontier was, I think, geographically not unsound, as it separated veldt, where vegetation, though never fresh, was none too sparse and included many non-desert forms, from a dune region extending to El Arish, wherein vegetation was much sparser and largely desert in character.

In the dried up steppe grew occasional clumps of *Zizyphus spina-christi*, which were always good for *Tarucus balcanicus* till about October 20th. I took two damaged *P. icarus*—probably near this insect's southern limit—a few *Z. karsandra*, and a few *E. alceae* g. a. *australis*. All these in September and the early days of October. On December 22nd, a single damaged *Z. karsandra* was seen, and on November 9th, a solitary *Teracolus fausta*. This and the *B. mesentina* seen here and at Deir el Belah, were probably strays or migrants. Their food plant, *Capparis*, does not grow in the veldt.

Other species seen were *Pyrameis cardui*, *Papilio machaon*, and *Colias edusa*—all uncommon. My batman, full of remorse at having broken my thermos flask while I was down with "sand-fly fever," pursued, and aided by a comrade, captured a large *P. machaon* in his cap! (about August 23rd.) It was not, of course, in "good order"

APRIL 15TH, 1919.

when brought in, but much resembles a Beirut summer specimen in my collection.

Erynnis alceae was always noted near a very woolly, pubescent, sage-like plant, possibly a *Phlomis* or *Marrubium*, but to my unbotanical mind close to the descriptions in Post's *Flora of Syria, Palestine, and Sinai*, pp. 633-634, of *Salvia aegyptiaca*.

In a garden (deserted) near the border, I took what I should have till lately called *Tarucus theophrastus*, but now believe to be *T. mediterraneae*, B.-Baker. Speaking from memory—my Egyptian and Syrian catches being in Cairo while I am now in Turkey—I should say that all, or nearly all, my Egyptian '*theophrastus*' are *mediterraneae*.

The larva of *T. balcanicus*, of which I took three full-fed specimens on *Z. spina-christi*, seemed to me to differ very slightly, if at all, from that of *T. mediterraneae*, but though I brought my larvæ up to Cairo during a few days' leave in September, hoping to be able to obtain the Egyptian larvæ for comparison, I failed to find the latter in the very limited time at my disposal. The pupal stage of my bred *T. balcanicus* was nine days in two instances, eleven days in the third. So much for the sparse butterfly population of Umm el Kilab. Of the Heterocera I will say nothing at present. Mr. Durrant has my "Micros," and my "Macros" are in Cairo.

On November 13th, during the action at Wadi Surar, I saw *Pieris brassicae*, one female. This was about half way between Gaza and Ramleh in Palestine. On December 28th I paid a visit to Khan Yunus. Here I saw—and disgracefully missed—*Pyrameis atalanta*, *Pontia daplidice*, and *Anthocharis belemeia*.

From January 19th to April 5th, 1918, I was at Bir Salem, also called Bir Yakub, near Ramleh, in the Coastal Plain. I had very little time for collecting. A visit of about three hours, on March 8th, to Kolonia, two to three miles west of Jerusalem, was my only "collecting trip." The country near Bir Salem was light soil, and rather sandy in places, otherwise rather heavy alluvium. Much of it was planted with olive and fruit orchards, and all was abundantly covered with vegetation—especially Crucifers—during the spring months.

The local naturalist, Mr. Aharoni, had been carried away to Damascus in 1916 by Jemal Pasha, of odious memory, who bade him start a Turkish Natural History Museum there—without funds!

My captures were:—

Polyommatus icarus.—At Bir Yakub, from March 7th to April 5th, sparingly; two fairly blue females among five taken.

Zizeeria karsandra.—Two specimens taken.

Lampides boeticus.—Two damaged specimens seen in early April.

Chrysophanus thersamon.—Five large specimens near Bir Yakub. At the end of March and beginning of April.

Rumicia phlaeas.—One male at Bir Yakub, March 10th. One female at Ludd (Lydda), April 6th.

Doritis apollinus var. *bellargus*.—Rare at Bir Yakub in March. Not infrequent at Kolonia, March 8th. Very frequent on slopes west of Hebron, descending towards Beit Jibrin, April 2nd (Lieut.-Col. A. C. Parker). Near Gaza, April 8th, one seen.

Pieris brassicae.—One female seen at Bir Yakub in January.

Pontia daplidice.—Surprisingly rare. Only one male in bad order, at Bir Yakub, on March 18th.

Anthocharis belemia.—I have about 100 specimens of this species, all but two from Bir Yakub. Specimens taken from January 20th to about March 20th, are quite unmistakably first brood specimens, with dark green, ground, and narrow silvery-white bands on the apex of the forewings (underside), and on the underside of the hindwings. These specimens differ slightly from the form predominating in a series of about 25 specimens of the first brood captured in Egypt from November to early February, in that the white bands and markings on the underside of their hindwings are somewhat more extensive than is the case with the Egyptian average. Two specimens taken at Kolonia on March 8th, were small, with narrow bands and deeper green ground colour on the underside hindwings. From March 15th to March 28th, we had very mixed weather, some very hot days, and some very cold. Specimens of *belemia*, taken from about March 21st to March 28th, were of three forms.

- (a) The second brood form *g. a. glauce* or *distincta*, as the Palestine form has been named.
- (b) A form resembling the first brood in its upperside markings, and somewhat closer to it than to *glauce* on the underside, but with more yellowish green ground on the underside hindwings, dull white or slightly pearly bands thereon, of the same general shape as in the first brood, but with less well-defined edges, and sometimes invaded by yellowish-green projections.
- (c) A few *belemia* of first brood form.

Form *b* was the most common.

After March 28th, only *g. a. glauce* (*distincta*) occurred. The conclusion I am inclined to draw is that this species is decidedly susceptible to temperature changes in nature, and that what I have called form *b* (*intermedia* is the obvious name, but it may be a *nomen preoccupatum*, as far as I know, for some *belemia* aberration, or for some form of a congeneric species) may be either a late emerged *g. v. belemia* or an early *g. a. glauce*. The "normal" sequence is:—

belemia—(*g. v.*).

|
glauce—(*g. a.*).

|
belemia—(*g. v.*), etc., etc.

But I feel pretty certain that in some cases

<i>belemia</i>		<i>belemia</i>		<i>belemia</i>
|	or	|	or	|
<i>belemia</i>		form <i>b</i>		<i>glauce</i>
<i>belemia</i>		<i>belemia</i>		form <i>b</i>

are the actual pedigrees.

Anthocharis ausonia (*belia*: *crameri*) *g. v. triangula* and *g. a. melisanda*.—The vernal form was not abundant at Bir Yakub between January 30th and March 18th. I bred a fine *g. a. melisanda* from a larva found on *Biscutella*, near our W/T station, which pupated March 30th, the butterfly emerging on April 10th. The vernal form was frequent at Kolonia on March 8th at a height of *circa* 2,000 feet.

Euchloë cardamines var. *phoenissa*.—Two males at Bir Yakub on March 6th and March 10th. Three ♂s at Kolonia, March 8th. On

the same day this charming little form was seen at Bab el Wad, above Latrun.

Colias edusa.—Not infrequent. ab. ♀ *helice* was occasionally seen.

Gonepteryx cleopatra var. *taurica* (*autonia*).—One ♂ seen at Bir Yakub, on March 1st.

Pyrameis cardui.—In most localities, usually worn.

Pyrameis atalanta.—Only one seen.

Shortly before I was invalided home to England, in June, I was shown a small collection of Rhopalocera in papers made by a brother officer near Ain Sinia, on or near the Jerusalem-Nablus road, at an average height of 2,500 feet. These insects were caught in April and the first half of May. I saw among them *E. alceae*, *C. thersamon*, *P. icarus*, *P. machaon*, *P. alexanor* var. *maccabaeus*, described as not uncommon; *Thais cerisyi* var. *deyrollei*, *Doritis apollinus* var. *bellargus*, *Aporia crataegi*, *P. rapae*, *P. daphidice*, *A. ausonia* g. a. *melisanda*, *Euchloë gruneri*, a large rather pale form somewhat resembling var. *armeniaca* as figured by Seitz, *Melitaea phoebe*, a small race resembling specimens I have from Beirut, *Melanargia titania* or something near it, and *Pararge megera*.

In conclusion I should like to give brother entomologists a few hints as to collecting in the Holy Land. For obvious and excellent reasons Palestine will be more, rather than less, visited after the war. I think, and I hope I shall prove a true prophet, that it will recover more rapidly and be better policed than any other part of the Near East during the next few years. Had I time for a long collecting holiday I should visit the country at the end of February—work the subtropical Jordan Valley, and especially Engeddi (Ain Jidi—8 hours by mule from Jerusalem, where the fine *Teracolus chrysonome* has been taken at the end of February), in March from Jerusalem, and also explore the foothills of the Judæan plateau, and the lower hills of Galilee and the Carmel range in March. In April and early May I should work the plateau and the Carmel range, looking out for *S. bavius* (Haifa), *E. gruneri*, *P. alexanor* var. *maccabaeus*, etc., and make at least one dash into the Jordan Valley at Jericho, taking good care (1) To sleep under a mosquito net at the Jericho hotel, (2) If going into long grass and thickets to wear leggings. The fact that the Ophidian fauna of the Jordan Valley includes the Cobra, Russell's Viper, Karait, Mesopotamian Viper, and Asp (*Cerastis*), and that ticks abound there explains this hint, though none of our troops were bitten there by serpents.

If the political situation and the time allowed, I should visit the Salt-Jerash region in late April, or preferably early May. All that is known to me of this Trans-Jordan country from a naturalist's standpoint is that *Zegris eupheme* occurs there, and that there is more timber and vegetation generally there than on the very bare Palestine plateau. It should give interesting results. Finally, let it be remembered that Jerusalem till April is a cold place, and late considering its latitude, in ordinary years, while the Jordan Valley, though rainier in winter, is to be compared with Upper Egypt and Nubia as far as spring and summer temperature is concerned.

AKABA AND SUEZ.

In May I left Suez for Akaba to join the Arab G.H.Q. before Maan.

My stay in Arabia was cut short by a violent and most painful attack of conjunctivitis to my great disappointment.

I made the following captures and observations :—

Azanus jesous.—A small form not uncommon round trees of *Acacia leucophlea* near Akaba, May 22nd, etc.

Chilades trochilus.—A few (worn) near Akaba, May 22nd, etc.

Tarucus mediterranea.—A fine form occurred near Akaba, May 20th-22nd.

Lycaenesthes amarah.—One male at Aka, May 22nd.

Pontia glauconome.—Either this species or *P. daplidice* was seen on the Akaba-Maan Road, May 24th.

Catopsilia florella.—A fine female seen but not taken, March 22nd, near Akaba. (At Suez, June 1st, males seen.)

Teracolus race *palestinensis*.—Several specimens of this rare and beautiful race of *T. phisadia* with one *C. florella* came off the land on May 20th, as our ship rounded Ras Mohamed, and flew about the rigging. I have Akaba specimens taken by a "French Naturalist" (who proved to be a German political agent some years later), in 1903 or 1904 I think, so recognised the insect. I made several attempts to catch the *Teracolus*, but failed, and all but went overboard from the rigging. Ras Mohamed is the southern extremity of the Sinai Peninsular.

Pyrameis cardui.—As usual.

Melitaea race *deserticola*.—A very typical, rather worn specimen of this race of *M. didyma* was taken in our camp at Akaba, on May 22nd.

I suppose Akaba is just Palaearctic, and if so, the capture of *L. amarah* so far north is of interest. I expect it will turn up in the Jordan Valley. *P. rapae* and *Danaüs chrysippus* were seen at Suez on June 1st.

SCORRIER.

During the last ten days of July, I was convalescing at Scorrier, near Redruth, Cornwall. Here *Pyronia* (*Epinephele*) *tithonus* was common, and gave some good aberrations. *Pararge aegeria* var. *egerides*, *Pieris napi*, with a very heavily marked female form, *Hipparchia semele*, *B. quercus*, with dark undersides, above the normal size, were common. Of a few *Plebeius aegon* (*argus*) taken generally in marshy places here and near Portowan, four miles to the north, I may note that some of the females show a certain amount of blue suffusion. *P. icarus* was not fully out. One *Aricia medon* was taken at Portowan at the end of the month. *Celastrina argiolus*, *Dryas paphia*, *Argynnis aglaia*, and *Pararge megera*, were uncommon. *Aphantopus hyperantus*, and *Epinephele jurtina*, abundant but worn. *Adopaea flava* was common. *Aglais urticae* swarmed. *P. cardui*, *P. atalanta*, and *Vanessa io*, were not very common. *P. brassicae* and *P. rapae* were as frequent as usual. *R. phlaeas* only just out, and *Coenonympha pamphilus* represented by one worn-out first brood specimen.

At Bude in August I found I was too late for *Lycaena arion*. I saw all the butterflies I had seen near or at Scorrier, except *A. medon* and *P. aegon*, and in addition took or saw *Angiades sylvanus*, *Ruralis betulae* worn on August 27th, near Poundstock, and *Gonepteryx rhamni*. ♀ *P. icarus* were generally suffused with blue, some very extensively.

C. pamphilus was rare; *A. urticae* larvæ gave me some nice dark imagines. On my way to Turkey in November I noted *P. rapae* common near Rome and near Taranto, November 11th and 12th and a few at Salonika, December 1st.

(To be continued.)

The various modes of Emergence and the Number of Annual Broods* of the Grypocera and of the Rhopalocera of Southern Europe, illustrated by the Tuscan species.

By DR. ROGER VERITY.

The researches conducted with great activity since the beginning of this century have increased our knowledge of the morphological variations of Lepidoptera in a notable manner, but many biological data have remained very deficient, and amongst these the data concerning the number of annual generations of each species. This, without doubt, is explained by the fact that the great majority of entomologists inhabit Central Europe, where there only occur, for the most part, one or two broods, of short duration and clearly to be distinguished, and because in the South of Europe observations have nearly always been made in an interrupted and incomplete form. Therefore the literature of the subject is full of hasty and hypothetical conclusions. It is enough to cite the case of Röber, the specialist in *Pieridae*, who states in as recent a work as the *Gross-schmetterlinge der Erde*, Seitz's edition, p. 61, that the *Gonepteryx* have only one brood in all the Palaearctic region! In general, however, the authors sin by excess, and even those few, like Tutt and Wheeler, who are very accurate and have exactly determined the number of broods in the greater part of the species, have fallen into errors similar to those into which I myself fell in the past (see "Contributions to the researches on the Periods of Emergence of Lepidopterous Imagines. The Diurnal Lepidoptera of the Pian di Mugnone, metres 119-274, near Florence." Part i., May 16th to July 26th, 1915, *Bull. Soc. Entom. Ital.*, anno xlv., pp. 112-117. Compare with dates following) with regard to the species with broods of long duration and precisely the species which are the most diffused and most abundant. Only data collected in an uninterrupted manner during the whole of the good season in the same locality could enlighten us and allow us to arrive at exact conclusions. With this idea, three years ago, I begged Signor Orazio Querci, whose vast annual collections have so much contributed to the knowledge of our lepidopterological fauna, to be so good as to collect material systematically from day to day in a locality near Florence. I have published the data thus obtained in *Bull. Soc. Ent. Ital.*, l.c., pp. 109-127, and Part ii. from April 9th to May 14th, 1916, anno xlviii., pp. 191-206. I shall publish this year Part iii., from August 5th to October 1st, 1917. These data, added to

* It must be observed that the word "brood" is used by entomologists in a most inappropriate way; "generation" would be the correct term, because the true so-called "broods" of Lepidoptera are offsprings of each other; the term "brood" would be correct only in the exceptional cases of "apparent generations" (*vide infra*), in which groups of individuals emerge at different times, but all belong to the same generation. Notwithstanding, I have in this paper used the word "brood" in the sense it has been given by entomologists.

the extensive knowledge of Central Italy, which Signor Querci has acquired in many years of collecting, and to my own personal experience, have allowed me to establish in a sufficiently exact manner, the various modes of emergence of the Rhopalocera, and have led me with regard to various species to unexpected conclusions, which seem to me not devoid of interest.

Northern Tuscany is a country well suited to show the maximum number of broods, which each species is apt to produce, because it lies on the boundary between the climate of Central Europe, where the season favourable for the development of Lepidoptera is limited by the greater duration of the cold, and that of the far south of Europe, where the heat and drought hinder their emergence for a more or less prolonged period during summer. It also offers, by reason of its intermediate position, the advantage of a variegated fauna, including the greater part of the European species of both hill and plain. I exclude for the present the single-brooded Tuscan Lepidoptera belonging to the higher mountains, which will be better placed in a special work on emergence in relation to altitude. The former in the meantime also prove to us that the emergence of the various species in the plain is much less variable than was thought, and that these can be gathered in a few groups, each of which behaves according to simple and fixed laws; bearing which in mind one can easily determine their mode of behaviour in each locality, even with only a few facts to go upon.

The causes of error, owing to which there have been hitherto so many fantastic theories on the numbers of the broods, are chiefly the two following:—

The first through not making a clear distinction between the period of emergence, or the true duration of the generation, and the period following, during which individuals, more or less old, continue to show themselves, but during which no more emerge. This last is very variable according to the longevity of each species; some have a short life and disappear soon after the close of the first period, while others have a very long life; therefore the second period may be prolonged till the beginning of a new brood. The importance of this distinction is shown by the following example: Prof. Stefanelli says that *Nisoniades tages*, L., is found in Florence from May to September in fact, old individuals, with the wings almost entirely laid bare of scales, are seen till the end of September, but the periods of emergence are two only, and the second one is comparatively very short; the first brood emerges from April till July and the late individuals of the second partial brood emerge before the 20th of August; Tutt has been misled for want of this observation by the entomologists of our country, and from the *data* of Stefanelli and other authors he concludes that the *tages* of southern Europe may have a third brood in September. The Rhopalocera with a longer life are the *Vanessidi*, which emerge in September and lay their eggs in April, and the *Gonepteryx*, chiefly, if not entirely, of male sex, which winter also at the imago stage (*imagines hibernantes*).

The female of *Satyrus circe* is also very long-lived, and presents a phenomenon worthy of note, which, to my knowledge, has not yet been made known; the males in Florence emerge at the end of June, and disappear altogether soon after; the females emerge during the

first days of July, but, at this season, rarely fly, and are only seen when the males carry them into the air *in copulâ*; in September they begin to fly, bearing on their wings all the marks of a long life, and some live till the end of the month; one may conclude from this that they show a true and proper summer lethargy, after copulation, and that they begin to lay their eggs when the herbaceous vegetation recommences to grow; there exist therefore examples of longevity produced by "aestivation" (*imagines aestivantes*) similar to those of hibernation.

The other cause of error, which in southern countries, like ours, easily leads to deception in the valuation of the number of broods, consists in the summer "pause," and in that of winter, which interrupt the emergence of Lepidoptera. I have already noticed the summer pause (*quies æstiva*) in vol. xlviii. of the *Bull. Soc. Ent. Ital.*, p. 179; I note that it lasts in the northern part of Central Italy about 15 days, between the beginning of July and the beginning of August, and that in Florence it lasts precisely from the 20th of July to the 5th of August. It overtakes some species during the emergence of the second brood and divides it into a group of precocious individuals and into a group of tardy individuals ("bipartite brood"). In Florence this happens to *Hesperia malvoides*, Elw. and Edw., which, among the species with two short broods, produces the second earlier than the others which generally commence to emerge immediately after the summer pause. On the Monte Conca, near Florence, at a height of about 300 m. above the sea, a similar splitting of a brood has been observed in *Plebeius ligurica*, Obth., race *mira*, Verity, described and figured in vol. xlv. of the *Bull. Soc. Ent. Ital.*, p. 231; the first group was found from the last days of June to the middle of July, the second at the beginning of August; no other broods of this species were found in this locality, but we may consider that it has two broods in localities less cold than the Monte Conca, which has a fauna of distinctly high altitude, notwithstanding its low height, owing to its having a north aspect; in the Val d' Ema, near Galluzzo (Florence), I have collected *ligurica* at the end of May and in June, therefore it is almost certain that it behaves like its relative *P. idas*, L., which has two broods in all Tuscany and even at Boscolungo, m. 1300, emerges twice (in the first ten days of July, and in the second decade of August).

Polyommatus icarus, Rott., and *Agriades thersites*, (Cant.) Chap., have, as we shall see later on, two broods of long duration, consisting of a series of families; these last emerge successively, during nearly all the good season, and there is no interval between the first and second brood, which can only be distinguished by the appearance of the insects; the summer pause separates, also in this case, the earlier families of the second brood from the rest, and they would doubtless be referred to the first brood if their appearance didn't enlighten us.

The winter pause has the same effect as the summer, and only differs from it by its greater length: it overtakes the last brood of some species soon after the beginning of the emergence of the perfect insects and, interrupting it, converts the remainder into the first brood of the following year; it is important to emphasize this fact, and to observe that this subdivision of a single brood into an autumn and a vernal group does not at all increase the number of generations or true broods;

therefore it is an error to call fourth and even fifth brood, as has been too often done hitherto, the autumnal individuals of some species, and to re-commence counting their contemporaries of the spring as first brood of the following year; because for this computation to be correct it would be necessary for the autumnal individuals to reproduce, and that their descendants constituted the vernal brood; this, indeed, may happen in very favourable localities and seasons in the case of a very small number of individuals of a few species, and we can speak in that case of a fourth "extraordinary" brood, but these are very rare cases, and one may remark that the earliest autumn individuals often belong to one sex only, the male; during the winter a few individuals of *Colias croceus*,* Fourc., of *Pararge megera*, L., of *Rumicia phlaeas*, L., and, though more rarely, of *Coenonympha pamphilus*, L., are always ready to emerge from the chrysalis when a few warm days interrupt the cold; thus, in 1916, we collected individuals emerged only a few hours before, in the Pian di Mugnone, in the first and again in the last days of November; in 1918, in a period of early and of late frost, with very mild days between, we found several on the 25th and 30th of January and 3rd of February. Also of *Polyommatus icarus*, and of *A. thetis*, I have observed the emergence in favourable years of a small number of individuals of both sexes in October, which showed the features of the first generation, and were evidently precocious autumnal individuals of the latter. We can add that in the case of *Gonepteryx rhamni*, L., and, in a less degree, in that of *G. cleopatra*, L., the emergence in autumn of a certain number of individuals, mostly, if not exclusively, of the male sex, which hybernate in the imago stage, and the emergence in spring of the rest of their brood is a constant fact.

We must therefore give up the notion of a fourth, and still more of a fifth brood, which too often figure in entomological literature, and say: "autumnal precocious individuals of the first brood." This expression may at first sight appear contradictory, but if one reflects that the reproduction occurs only in spring, it seems to me sufficiently justified.

By the name "apparent generation" one might designate in a generic manner those groups of individuals or families which emerge at a distance in time from their contemporaries owing to the "pauses" or other reasons, and might by superficial observation be considered a brood by themselves.

* * * * *

Bearing in mind the preceding observations, and therefore guarding against errors of interpretation in the examination of the *data* we possess, it will prove easy to group the species according to whether they produce one, two, or three "ordinary" broods (we shall see further on the significance of this word), in climatic, geographical and annual conditions most favourable to the development of the greatest number of the said broods.

We may take note:—

(1) In the case of a single brood the condition of perfect insect is reached at different periods of the year, according to the species.

(2) In the case of two broods the first always emerges in the second half of spring, and the second in August or, more rarely, at the begin-

ning of September, except a few species with very long graduated emergence, and also *Hesperia malvoides* which emerge in anticipation at the beginning of spring and at the end of July, and some *Vanessidi*, which emerge later at the end of June and in September or October.

(3) In the case of three broods the first emerges in the first half of spring, the second at the beginning of summer, and the third at the end of August and in the first half of September.

These periods of emergence remain almost fixed in all the regions in which the greatest number of broods are produced, and the variations of altitude and latitude only influence the duration of the period of emergence by lengthening or shortening it, chiefly in the first brood.

We arrive, therefore, at two general conclusions, all the more interesting in that they were unexpected:—

(1) The maximum number of ordinary annual broods vary in the *Gryocera* and *Rhopalocera* from one to three, according to the species.

(2) Some species, which emerge in an almost continuous manner during all the good season and have apparently an indefinite number of broods, have in reality only two.

The following examination of the different types of emergence and their modes will serve better to clear up and illustrate these conclusions. The most notable difference among the various modes of emergence consists in the variableness of the duration of each brood in the different species; in this respect there are two principal types to be distinguished: *a*. In one all the families of the same locality emerge almost at the same time during a period which varies according as the individuals which compose it emerge, almost contemporaneously, or gradually; thus some species emerge in a mass during a few days, and, although the numbers of individuals may vary from year to year, the days of the year remain always the same with an almost incredible constancy. *Cupido sebrus*, for example, emerges in Florence from the 10th to the 20th of May, *Agriades escheri*, Hüb., from the 6th to the 16th of June, etc. Other species, instead, emerge during a relatively long period; thus, the males of *Epinephele jurtina*, L., appear in the perfect state from the end of May to the end of June, and the females from the middle of June to the end of July; in other cases, again, one observes a relatively short period in which the mass of individuals (the "nucleus" of the brood) emerge, another preceding and another following, more or less long, during which a much smaller number of individuals ("sporadic—precocious" and "sporadic—tardy") emerge; the precocious individuals are nearly all males; for example, the third brood of *Colias croceus*,* Fourc., and that of *Rumicia phlaeas*, L., fly in September, but sporadic individuals appear from the first days of August; *Satyrus major (hermione?)*—G.W.), Esp.; is properly of July, but appears sporadically from the end of May; *Lampides boeticus*, L., and *Raywardia telicanus*, Lang, belong properly to September, but some individuals are seen from the end of June; the first brood of *Agriades thetis*, Rott., belongs properly to May, but tardy individuals emerge till the middle of June.

b. In the other of the two principal types mentioned the period of emergence for each brood is very long and entire families complete their development successively at different periods, though belonging to one brood only ("graduated emergence"); in this case there can be distinguished "precocious families" and "tardy families"; the

winter and summer pause may divide them distinctly into a "precocious group" and into a "tardy group," as we have already indicated; besides, also in this case, there exists in every brood generally a period in which a greater number of families emerge ("nucleus" of the brood). *Pyrausta cardui*, L., which emerges from the middle of May to the middle of July and again in August and September, and *Melitaea didyma*, Esp., from the beginning of May to the summer pause, and during all August till the 5th of September, are examples of species with two graduated broods.

In other cases, such as occur in Florence, in *Coenonympha pamphilus*, L., in *Polyommatus icarus*, Rott., and in *Agriades thersites* (Cant.), Chap., there is no interval between the end of the first and the beginning of the second brood, indeed, during some days, these may even overlap; the individuals of the one, and those of the other, can be distinguished in this case only by the morphological characteristics, generally very marked, which they present. Let us examine the mode of behaviour of the three species above mentioned during the entire year.

The first generation of *C. pamphilus* emerges in a very graduated way from about the 10th of April to the end of July; the earliest spring individuals often have a characteristic underside to the hindwings, which are blackish with a bluish gloss (form *murina*, Vrtv.); the rest of that brood has a grey colour with scarcely visible patterns and very limited white space. The second generation emerges from the beginning of July to the middle of September; in July and the first two decades of August a very characteristic form is produced, with a light tawny underside, prominent patterns and large numerous ocelli (form *emilyllus*, Vrtv.); these consequently contrast sharply with the tardy individuals of the first generation, which emerge at the same time during July. At the end of August and in September a reversion to very nearly the same form as that of the first generation takes place, although traces of tawny and a slightly more prominent pattern distinguish most specimens from those of the latter (form *aestivalis*, Rv.). Finally, in October, a very limited emergence of a few individuals often occurs in favourable years and these resemble the early spring ones mentioned above by their blackish underside.

Now, it must be noted that in Florence by far the greatest number of *C. pamphilus* emerge in April and May; they then dwindle to very small numbers in June and July, until the tawny form makes its appearance, when they again increase considerably; the end of August and beginning of September emergence is very poor. On the other hand, on the Tuscan coast, at Forte dei Marmi, the chief emergence takes place later, in May and June; the tawny form of July and the beginning of August is quite scarce and the emergence of the end of August and beginning of September is decidedly abundant. I conclude that in both localities only two real generations occur, as in *C. arcania*, and that the other emergences are due to precocious or tardy families, as the case may be. The particular extreme forms *murina* and *emilyllus* are the result of particular climatic conditions during the development of the chrysalis. A phenomenon which still calls for explanation if climate can effect the chrysalis stage so deeply is why do July individuals with the characters of the first brood emerge at the same time as others with the very distinct characters of

emilyllus. There is no doubt that the former are tardy individuals of the first generation developed from "laggard" larvæ; the latter probably are produced by the larvæ of the second brood which have fed up rapidly in June in the full heat on dry food; the end of August and beginning of September lot is probably the result of larvæ which have fed slowly and have got to the chrysalis stage when the climatic conditions were again more similar to those of the spring. The few October individuals are no doubt precocious autumnal ones of the first generation of the following year.

(To be continued.)

Notes of the Season 1918 from East Tyrone.

By THOMAS GREER.

Although the winter 1917-18 was severe (snow falling heavily in October), yet on February 27th willows were in full bloom in many places, a record date for the district. The months of March, April, and May, were unusually mild and sunny, and spring insects emerged a fortnight to three weeks before their usual time. On March 10th I spent the evening on the Lough Neagh bogs, and found *Tæniocampa opima* out in number on the dwarf willows; the next day I visited a rough, steep hillside, where (in July, 1917), a few worn *Melitæa aurinia* were observed flying over the rough herbage. I found the slopes literally alive with the larvæ crawling actively in the hot sun; the imago from this locality (bred later in the season), is smaller and much redder in colour (ab. *artemis*) than the bogland form. On April 5th a fine female *Pachys strataria* was discovered on a willow trunk, a very unexpected addition to the local Lepidoptera, the nearest known habitat being in the Co. Wicklow. The first *Euchloë cardamines* appeared on the 10th, and a number of interesting minor aberrations were taken during the month and in early May; among others the following—three males with dark border 3 mm. wide on outer margin of posterior wings, male with orange tip much diffused with dark scales, male with very pale orange tips, several males and females with discoidal on anteriors indicated by a black spot only, a teratological example of male right posterior deeply scalloped on outer margin. On 7th of May, in company with my friend Dr. Spence, whose interests are chiefly botanical, I visited a swampy wood on the western edge of Lough Neagh, remarkable as sheltering the largest colony of the Royal Fern, *Osmunda regalis*, now to be found in the county; *Thalictrum flavum* also grows here in quantity. We found the wood swarming with Geometers, mostly *Lomasipilis marginata*, *Hydriomena impluviata*, *H. ruberata*, and *Xanthorhoe montanata*; with *X. sociata*, *Mesoleuca albicillata*, and worn *Lampropteryx suffumata*, in lesser numbers; they flew from the tree trunks in dozens, and arose in crowds from the dense herbage at our approach. Again, on the 10th we explored an extensive limestone outcrop overgrown with sloe, hazel, and ash; here the spring brood of *Pararge ægeria* was abundant, and *P. megera* in small numbers frequented the bare rock; a single *Bapta temerata* found at rest on a leaf was a more interesting capture, and returning in the evening a few days later, the species was found in some quantity flying over the tops of the sloe bushes, at the same time several *Cilia glaucata* were secured; both these species when at rest resemble bird

droppings. The first *M. aurinia* emerged on the 26th, and a female *Diaphora mendica* var. *rustica*, captured flying in afternoon sunshine, laid a good batch of ova (badly wanted by a correspondent). From this date till the middle of June hundreds of *M. aurinia* emerged from nests collected on the bogs in the autumn, and from the hilly locality already mentioned in the spring; a representative series of local variation, including abs. *præclara*, *hibernica*, *scotica*, and *artemis* were retained, and the remainder liberated. It was observed of the autumn collected larvæ that only about two per cent were parasitised, whereas in the spring larvæ the percentage amounted to at least forty.

On May 22nd *Hemaris tityus* (*bombyliiformis*), was seen flying rapidly over swampy ground, but very skittish and difficult to capture owing to the abnormally hot weather; a female was observed flying quietly over the scabious plants and alighting now and then to lay a single egg on the underside of the leaf near the base. In the same locality later on the flowers of the Ragged Robin, *Lychnis flos-cuculi*, were very attractive, *Dianthoecia conspersa*, *D. cucubali*, *Plusia festucae*, *P. iota*, and *P. pulchrina*, visiting them in some number, together with an occasional *Hecatera serena* and *Rusina tenebrosa*.

Polyommatus icarus, which was very scarce this year, appeared on June 20th in its very restricted localities, where it is single brooded.

Towards the end of the month a whole day excursion was made to the moorlands in the Lough Fea district (some ten miles away) for *Coenonympha tiphon*. The lake lies at an altitude of 750 feet, and is overshadowed by mountains on the east and west, it is sheltered by woods on the north, these woods, planted some sixty years, consist of Scots fir, beech, oak, and birch; before that time the lake was bare and exposed, with a shrubby fringe of willow, birch, and alder, on which now, larvæ of *Amorpha populi*, *Smerinthus ocellatus*, *Dicranura vinula*, *Cerura furcula*, *Pheosia tremula*, *P. dictæoides*, *Notodonta ziczac*, *N. dromedarius*, and *Pygaera pigra*, are to be found, often in abundance during the autumn months. Northwards of the lake a wilderness of bog extends for miles, dotted with bright green morasses, in one of which the writer nearly came to an untimely end, when netting *D. conspersa* of a dark form (var. *suffusa*) at the Bogbean (*Menyanthes*) flowers.

On the lower slopes of the mountains are numerous flat boggy basins, the chosen haunts of *C. tiphon*, and separating the boggy areas are many little gravelly hills covered with heather and *Vaccinium*, over which *Parasemia plantaginis* dashes in its zigzag flight, and *C. tiphon* often strays on to the heathery heights to feed upon the yellow blossoms of the *Potentilla*, which seems to have a greater attraction than the pale pink bells of *Erica tetralix* in its boggy home. In the woods, *Pararge aegeria*, *Euchloë cardamines*, and *Dryas paphia* are now to be found, having gradually progressed up the valley from the lower ground.

On this occasion the males of *C. tiphon* were just emerging, and as the day was calm (which happens rarely) a nice series was soon obtained, *Plusia interrogationis* also put in an appearance, darting about in numbers among the long heather on the hill-side; it also flies at dusk and frequents the flowers of the marsh thistle (*Cnicus palustris*), growing in the damp meadows down by the loch, accompanied by *P. festucae* and *P. iota*, when it is easily captured. Early in July, another visit was paid to the locality, when the females of *C. tiphon*

were found fully out, but as the day was rather breezy, many more were seen than captured. Towards the close of the month, a visit was paid to the Lough Neagh bogs, where a number of *Aspilates strigillaria* and *Selidosema ericetaria* were walked up and netted, including a melanic variety of the latter, all the wings being of a dark sooty or leaden colour. For this aberration, I suggest the name *fumosa*. The following is a description of this variety, which I provisionally name *fumosa*: male, all wings blackish, suffusion uniform with the marginal band, faint pale sub-marginal line, and discal marks faintly indicated; this seems similar to ab. *pyrenaearia* except for the ground colour being blackish instead of violaceous grey. I have a form leading up to this dark type, with all the wings streaked with blackish, inner edge of marginal band much broken up, central fascia blackish.

In the marshes, swarms of *Coenocalpe vittata* and *Xanthorhoe unanulata* flew at dusk, and *Apamea ophiogramma* was abundant at *Glyceria fluitans* growing in the drains; *Geometra papilionaria* was taken flying slowly round the alders.

Early in August I was on an old worked-out bog covered with coarse grass, sedges, and rushes, over which a few belated *Polyommatus icarus*, and a number of very dilapidated *Epinephele jurtina* females were flying; one of the latter I casually netted, and on examining it, I saw that it had two distinct black spots on the fulvous area just below the apical ocelli. Needless to say, I captured and scrutinised all the females that were about, and at least every second example had one or more of these spots on the fulvous area; however, only three were in fair condition, the remainder, being hopelessly worn and ragged, were liberated. Some time after, I came upon a note in *The Record*, xv., 168, describing the capture of two similar specimens in the south of Ireland, and also that Mr. Mousley had named this aberration *addenda*. I hope to visit the locality again during the coming season.

During the month, working the ragweed bloom paid well, particularly a large patch growing in a clearing in a small birch wood, when the following were observed or captured, *Cidaria truncata*, and *C. immanata* in swarms, *Eupithecia subfulvata*, *Lygris prunata*, *L. testata*, deep purple in colour, *Noctua triangulum*, *N. baja*, *N. xanthographa*, several black, *Agrotis nigricans*, *A. tritici*, *Miana literosa*, *M. bicoloria*, *Helotropha leucostigma*, *Triphaena comes* var. *rufa*, *Calymnia trapezina*, *Dyschorista suspecta*, several nice forms. *Hydroecia crinanensis* was hardly as abundant as usual, and *H. lucens* very scarce.

In September, *Amphipyra pyramidea* turned up at the sugar in some numbers in the same birch wood, here at its extreme northern range in Ireland. *Calamia lutosa* was found to be plentiful when searched for on the outskirts of reed-beds during the month of October; and sugaring at the same time in a large wood, where felling was going on, I found "the sweets" almost deserted, and the butts of the fallen trees, oak, ash, and sycamore, covered with moths feasting upon the exuding sap; *Orrhodia vaccinii*, easily first in point of numbers, with *Scopelosoma satellitia*, *Amathes (Orthosia) lota*, *A. (O.) macilentia*, *Calocampa vetusta*, and *Xylina socia*; on the way home, about two dozen larvæ of *Eupithecia succenturiata* were picked off mugwort, *Artemisia vulgaris*, only six of which pupated successfully.

My last outing was on October 30th, when *Hybernia aurantaria* was found resting on the bare birch twigs, and *Himera pennaria* flew wildly round the lamp.

NOTES ON COLLECTING, Etc.

TORTRIX VIRIDANA AND HIBERNIA DEFOLIARIA AT LEATHERHEAD.—In May, 1918, most of the oak trees around Leatherhead, and all the way down to Brighton, were defoliated by *Tortrix viridana* and *Hibernia defoliaria* larvæ, and the latter were also abundant on hazel and other trees. A friend who was with me in the wood at Box Hill thought it was beginning to rain, and it was not until I held out my net that I could convince him that the sound was only the excreta of the larvæ falling on leaves of the undergrowth.

I have just come across Dr. Chapman's note (*Ent. Record*, Vol. XXX., pp. 136-7) with regard to the larvæ of *T. viridana* pupating in the crevices of the bark of a single tree, and I am wondering if what I observed at a wood near Leatherhead will account for it.

About 30 yards from the edge of the wood on the N.E. corner was a solitary oak, which was feeling the full force of a stiff S.W. wind down two sides of the wood. The tree was quite bare of leaves, and from the branches were hanging large numbers of *T. viridana* larvæ on their silken threads, which were blown backward and forward by the wind, so that quite a number were getting a foothold on the bark, some however reached the ground. Whether these eventually crawled back to the trunk or spun up in the undergrowth I cannot say, but on visiting the tree a few days later the trunk was a mass of cocoons, and I took a few home to make sure of my identification.

It has always puzzled me why in certain years we get this abundance of a particular species all over the S.E. counties. Has it anything to do with the weather. In the Spring of 1918 we had a remarkably long spell of dry weather, which possibly may account for it, a wet season being notoriously fatal to larvæ.—C. W. COLTHRUP.
February, 1919.

PAIRED LEPIDOPTERA IN FLIGHT, 1918.—At last I get an opportunity to give a list of observations made last year of the carrying habits of butterflies when paired.

<i>Aricia medon</i> (astrarche)...	June 1st, 1 pair, ♂ carrying ♀, Leatherhead.
<i>Epinephele jurtina</i> ...	July 5th, 3 pairs, ♀ carrying ♂.
" " ...	July 6th, 3 pairs, ♀ carrying ♂.
" " ...	July 7th, 2 pairs, ♀ carrying ♂, Mickleham.
<i>Epinephele tithonus</i> ...	July 27th, 1 pair, ♀ carrying ♂, Bourne-mouth.
" " ...	July 29th, 1 pair, ♀ carrying ♂, Swanage.
<i>Agriades coridon</i> ...	August 3rd, 1 pair, ♂ carrying ♀, Swanage.
<i>Polyommatus icarus</i> ...	August 7th, 1 pair, ♂ carrying ♀, Bourne-mouth.
" " ...	September 1st, 1 pair, ♂ carrying ♀, Leatherhead.
<i>Hipparchia semele</i> ...	August 7th, 1 pair, ♀ carrying ♂, Bourne-mouth.

I have just come across the following in my old notebooks, and not previously recorded.

<i>Agriades coridon</i> ...	September 8th, 1909, 1 pair, ♂ carrying ♀.
" " ...	September 11th, 1909, 1 pair, ♂ carrying ♀.
" " ...	September 24th, 1909, 1 pair, ♂ carrying ♀.

<i>Polyommatus icarus</i>	...	September 9th, 1909, 2 pairs, ♂ carrying ♀.
"	"	July 25th, 1911, 2 pairs, ♂ carrying ♀.
<i>Pieris rapae</i>	...	July 25th, 1911, 1 pair, ♂ carrying ♀.
"	"	July 21st, 1911, 1 pair, ♂ carrying ♀.
—C. W. COLTHRUP, February, 1919.		

SECOND BROOD OF ABRAXAS GROSSULARIATA.—I was very much surprised on December 16th, 1918, to find a larva of *A. grossulariata* spinning up under a coping at Margate.

I know that second broods are not uncommon on the West Coast, but it is the first time I have come across this on the East Coast. The larva pupated the same day, and the pupa still looks healthy.—C. W. COLTHRUP, February 15th, 1919.

TUBULIFERA FROM LEICESTERSHIRE IN 1918.—*Chrysis ignita*, L., *C. rudii*, Shuck., *C. cyanea*, L., and *Elampus auratus*, L., all common. *Elampus aeneus*, Fab., one specimen from a bramble stem at Market Bosworth without other occupant. *Elampus auratus* was raised from bramble stems containing *Passoloeus insignis*.—L. A. Box, 80, Northampton Road, Croydon.—March 4th, 1919.

CURRENT NOTES AND SHORT NOTICES.

The volume to be issued by the Ray Society for the present year will be a "Monograph of the British Orthoptera," by Mr. W. J. Lucas, B.A., F.E.S. No doubt all those interested in our British Fauna will send their subscription, one guinea, to the Treasurer of the Society so that by membership they may possess a copy. It will be remembered that some years ago Mr. Lucas dealt with our British Dragonflies in a masterly work upon them, the volume being well illustrated with coloured plates and by his own photographs and drawings.

I was greatly pleased the other day to receive a card from the Hon. Sec. of Société entomologique de Namuroise to say that the Society had been re-established and to ask for correspondence. Since then a copy of the first number of the *Revue Mensuelle* has come to hand, the first which has appeared for 53 months since the fateful July, 1914. Among the contributors to its pages we welcome the well-known names, Messrs. le Baron G. de Crombrugge, J. L.-J. Lambillion, Ch. Cabeau, and F. Derenne. We heartily welcome this resuscitation and wish the Society and its *Revue* every possible success.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

November 28th.—THE ANNUAL EXHIBITION.—MESSRS. E. W. Nimmey, F.E.S., of Watford, and D. C. Johnstone, of Rayleigh, were elected Members.

Mr. W. G. Sheldon exhibited a very long series of *Sarrothrips revayana* (*undulatus*) including the forms *ramosana*, *stonanus*, *dilutana*, *fusculana*, *ilicana*, *afzelianus*, *lathamianus*, *undulana*, *bifasciana*, etc.

Mr. W. J. Lucas, an album of photographs of well-known entomologists in the field.

Mr. R. South, three aberrations of *Brenthis selene*, for Mr. Penn of

Brighton:—(1) Melanic with only traces of the fulvous ground; (2) Pale straw-coloured ground; (3) Pale buff-coloured ground; also a ragged specimen from the New Forest similar to (1). Mr. South also showed *Epinephele jurtina* (1) With pale hindwings, ♂, (2) With lower part of fulvous blotch white, ♀; *Tricopteryx polycommata*, for Mr. L. Meadon, two brown suffused specimens, bred; and various species of Coleoptera.

Mr. W. J. Lucas, five species of *Nemopteridae* (Nat. Ord. *Neuroptera*) from the S.E. Mediterranean district, including *Nemoptera sinuata*, *N. bipennis*, *N. coa*, *Lertha barbara*, and *Halter pallida*.

Mr. H. J. Turner, series of (1) *Euchloë cardamines* race *turritus* from Cyprus, with ♂ and ♀ examples of the very small ab. *minor*. (2) *Parnassius apollo* race *pumilus*, from the Calabrian Mts., S. Italy, a very local and small race. (3) *Colias edusa*, the clear yellow form ab. *helicina*, from Cyprus, and ab. *helice*, one with orange hindwings. (4) *Satyrus briseis* race *fergana*, from Cyprus, with the rich orange brown ab. *pirata*; together with a very small male from Neu Spondinig. (5) *Satyrus priouri*, from Spain, a species similar to the last with its parallel ab. *uhayonis*. (6) *Agriades coridon*, the single brooded species from near Florence, with ab. *albo-lunata*. (7) *Agriades aragonensis*, the double brooded species from the same ground. (8) *Plebeius aegon* race *masseyi*, ♂ and ♀ from Witherslack. (9) *Coenonympha tiphon* race *philoxenus*, from Witherslack. (10) *Notodonta ziczac*, a second brood specimen bred in a sleeve in Dr. Chapman's garden at Redhill, July 31st, 1918. (11) *Agriades coridon* ab. *semisyngrapha* and ab. *roystonensis*, from Royston, ab. *per-aurantia*, and ab. *irregularis-obsolata*, from Reigate. (12) *Salebria semirubella* (*carnella*), from Box Hill, with ab. *sanguinella*. (13) Examples of *Danaida plexippus* (Asia), and *D. archippus* (America), and called attention to the absolute confusion for the past 150 years, in the application of these two names; etc.

Mr. J. H. Carpenter, aberrations of undersides of *A. coridon*, including many named forms.

Mr. L. W. Newman (1) Long series of the Irish form of *Melitaea aurinia*, from Tyrone larvæ. (2) Curious *Aglais urticae* and *Argynnis cydippe* (*adippe*), with a sheen. (3) Aberrations with bleached forms of *Triphaena janthina*. (4) A gynandromorph of *Dryas paphia*, three wings=*valezina*, one wing partly ♂ *paphia*. (5) A yellow *Aglais urticae* bred. (6) Long varied series of *A. coridon*, *C. pamphilus*, and *R. phlaeas*. (4) (5) and (6) were on behalf of Mr. Percy Richards.

Mr. R. Adkin (1) *Argynnis paphia*, an aberration with the marginal wedge-shaped spots enlarged, the submarginal spots much elongated, and other markings intensified. Underside forewings with confused markings, hindwing with a large basal silvery patch. (2) *Peronea variegana*, a bred varied series.

Mr. L. W. Newman, for Mr. Oliver, aberrations of (1) *A. urticae*, from ab. *alba* to ab. *salmonicolor*, with ab. *ichnusa*. (2) *Epinephele jurtina*. (3) *Ruralis betulae*, ♀ without the white line underside. (4) *Argynnis aglaia*, bleached, and ab. *belisaria*. (5) *A. coridon*, ♂s, grey, blue, and green forms, and many striking forms. (6) *Aricia medon*, yellow spotted. (7) *Celastrina argiolus*; true halved gynandromorph (Sutton Park), etc.

Mr. Newman, for Mr. Sabine, a large collection of *Noctuae*, Ireland, 1918, with a number of racial series, and individual aberrations.

Mr. C. H. Williams, aberrations of *A. coridon*; including ab. *albina*, ab. *syngrapha*, ab. *marginata*, etc.

Mr. B. W. Adkin, long series to illustrate the variation in (1) *A. paphia*, a gynandromorph ♂ and pale ♀, a dark suffused specimen, a small bred example with hindwings brown beneath, 2 ♂s with large white patches, and forms of ab. *valezina*. (2) *Eugonia polychloros*, in depth of colour and extent of markings.

Mr. Stanley Edwards, sections of the genus *Euploea* from India and the Malay.

Mr. H. A. Leeds, a large number of individual aberrations of *Pararge aegeria*, *E. jurtina*, *E. tithonus*, *Aphantopus hyperantus*, *C. pamphilus*, *A. thetis*, *Polyommatus icarus* (8 phases), *Agriades coridon* (19 phases), *Aricia medon*, *Strymon pruni*, and *Bithys quercus*.

Mr. R. Bowman, *Numeria pulveraria*, 2nd brood, August, 1918, with much deeper markings; and *Rumicia phlaeas* ab. *eleus*, Horsley, August, 1918.

For Mr. Ing, Mr. Newman showed *Arctia caja*, bred series including one with chocolate brown covering almost the entire forewings, with orange hindwings, emphasised markings, and body largely melanic.

Mr. F. W. Frohawk, (1) *Brenthis euphrosyne*, showing variation in coalescence of spotting; (2) *Euchloë cardamines*, variation in colour, and size of apical and discoidal markings, etc.; (3) *Chrysophanus dispar*, ♂ symmetrically white-marked wings bred by Doubleday; (4) Two *Issoria lathonia*, Colchester, 1818; (5) Varieties of the Starling (grey, cream, white, and buff), and of the Pied Wagtail (pied and mottled with white).

Rev. G. Wheeler, *Pararge megera* ♀ ab. *mediolugens*, near Guildford, 1918, and *Rumicia phlaeas*, ab. *suffusa*, ab. *caeruleo-punctata*, and ab. *intermedia*.

Mr. Riches, a series of aberrations of *Abraxas grossulariata* from N. London.

Dr. E. J. Salisbury, branched carpels in *Clematis vitalba*, and discussed this aberrational growth.

Mr. A. A. Buckstone, (1) *Hygrochroa syringaria*, bred series of specimens with abnormal wings, parents ♂ normal, ♀ deformed; (2) Many bleached and teratological specimens, and suggested that much was due to the ill-development of the first pair of limbs, the main prehensors in the period of wing-expansion.

Mr. H. Moore, *Anosia archippus*, racial forms from areas ranging from Canada to the Argentine.

Rev. J. S. Tarbat, for Mr. Burras, (1) *Dryas paphia*, much coalesced and suffused examples; (2) *A. cydippe* (pale); (3) *Phragmatobia fuliginosa* (yellow); (4) *Lithostia deplana* (very dark); (5) *Calymnia trapezina* (extremes of aberration).

Rev. A. T. Stiff (1) *Amorpha populi*, buff and pink form; (2) *Saturnia pavonia*, with pink marginal band on hind-wings; (3) *Arctia villica*, ♀ with confluent spots and hind-wings almost devoid of markings; (4) *Arctia caja*, ♂ salmon-pink, ♂ yellow, ♂ pink-yellow and confluent spots, several with dark forewings; (5) *C. pamphilus*, with extra ocelli below, etc.

Mr. Ashdown, long series of aberrations of *Adalia bipunctata* (Col.).

Dr. T. A. Chapman, *Orgyia vetusta*, California, a long, variable

bred series, with *O. antiqua*, *O. splendida*, and *O. auro-limbata* for comparison.

Mr. G. Fryer, *Scodion fagaria (belgiaria)*, a melanic example, and *Polyommatus icarus*, a striated form.

Captain B. S. Curwen, a number of species of British Fossorial Hymenoptera, including the rare *Methoca ichneumonidae*.

Mr. W. West, for the Society, the collection of Canadian Lepidoptera.

Mr. L. Tatchell (1) *Dryas paphia*, with heavy markings; (2) *E. polychloros* with light underside; (3) *A. urticae*, ab. *polaris* bred; (4) *Agriopsis aprilina*, typical, melanic, and ab. *virgata*; (4) the exotic Pierid *Hebemoia glaucippe*, India, with races *australis*, S. India, *sumatranus*, *celebensis*, and *javanensis*.

Mr. A. A. Buckstone for Mr. Pugsley, *Plutella cruciferarum*, bred from wild seakale.

Mr. A. Butterfield, *Teracolus evanthe*, Madagascar, three forms of the ♀, the ♂, and a rare aberration of the ♂ with apical blotch clear lemon yellow.

Mr. Cuzner, microscopic slides of the life-history of the *Hydrozoa*.

Mr. W. J. Kaye, a very fine graduated series of *Heliconius melpomene*, to show the range of the lines of variation, local, aberrational, and developmental, illustrated by the named forms.

REVIEWS AND NOTICES OF BOOKS.

PROCEEDINGS OF THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, 1917-18, 36+xvi. pp., 2 PLATES.—An apology is certainly 'due to the forty-sixth issue of this very interesting publication for the delay in taking notice of it. The excuse is one which will perhaps be called in history an early 20th century one, namely, that everybody is suffering more or less from the strain of the last four years, and now from the reaction resulting from the relief.

As before, we congratulate the Editors upon their work. Of necessity the pages are fewer—but the paper we are pleased to find is as good as ever, in times when paper is more than anything else, almost blotting paper. This paper will take heavy pen and ink notes without running.

The Report of the Council is again very satisfactory. The membership continues to remain steady—158 against 163 of the previous report. As eight members have been removed by death there appears to be no leakage. Now that the terrible strain has been removed, and people are returning more and more to civilian life and freedom, we hope that the Hon. Librarian will be able to report in the future an increased use of the books, and a larger sale of the *Proceedings*.

Presidential Addresses are wont to be somewhat deep. Mr. Turner's on "Some possible Steps in the Evolution of Man" is no exception. Being purely speculative, it is difficult to criticise. Looking back upon one's own somewhat extended life, it would appear that, at least in some cases, the "Arboreal Habit" can be entirely lost, even when its retention would have been useful for one's happiness—or even for one's life, to be able to climb a tree. Moreover, its disappearance must take much from the anxieties of mothers and nursemaids.

Within the limited space allowable under present day restrictions, it is plainly impossible to do justice to the many interesting subjects dealt with, covering as these do so many Orders.

Notes on points of difference between closely allied species are always important and interesting. Mr. L. W. Newman, commenting upon the differences between *Tephrosia bistortata* and *T. crepuscularia*, mentions that the female of the former covers her eggs with hair, while the latter lays her eggs bare. It is therefore a curious and noteworthy fact that the females of both species are equally supplied—or over supplied—internally with masses of hairs for that purpose.

Modesty forbids that we should comment upon the kindly hospitality given the writer's plate and simple notes upon the *British Psychidae*. He hopes that as field collecting revives, and fresh collectors come on, this group will receive greater attention.

Mr. Frohawk's notes on the sexual differences in the wing-markings of the larger butterflies, *Eugonia polychloros*, *Polygonia c-album*, and *Euvanessa antiopa*, appear to be novel, and worthy of recollection.

Mr. R. Adkin's exhibit of *Rhyacionia (Retinia) purdeyi* as a distinct species is an important record.

As touching possibly upon the spread of Lepidoptera over new regions we notice again the exhibition of a specimen of *Manduca atropos* from Durban. Natal was proclaimed a British colony in 1843, and although there was a small population of whites, British and Dutch, it was not until the "late forties" that there was any extensive immigration. The edible potatoe is, of course, not indigenous to South Africa, although *Solanaceae* of different sorts abound. The writer lived in Durban and on the coast from 1872 to 1875, but although he collected assiduously during that period he never saw the "Death's Head Moth."

Mr. A. A. Buckstone's observations on the dwarf specimens of *Agriades coridon* from a Surrey hill-top will surely attract further attention. The most curious point about them would appear to be, that the mother butterflies, with the whole world before them, are yet content to oviposit, and the resulting larvæ are content to remain, on a spot where food is so short. For of a certainty these small forms are starved almost to extinction. The observation that the dwarf males are never seen in copulation is most interesting.

The details of the life-history and distribution of *Pararge aegeria*, which was noticed in last year's *Proceedings*, taken in hand by the late A. E. Gibbs, and continued by Dr. R. C. L. Perkins, are continued, and cannot but be of permanent value. Mr. Prideaux's observations upon the oviposition of *P. megera* are also of lasting importance.

Mr. B. W. Adkin has some valuable remarks to make upon the variation of *Agriades coridon*. His qualms as to the "boundary walls" of varieties are of interest. Surely we must hold on to the old rule of "recognising the bricks and ignoring the mortar." Intermediates between aberrations must of necessity be, otherwise one supposes the forms would be almost species.

Laying down the pen the writer feels that he has done but inadequate, as well as tardy, justice to this very interesting little publication, which will remain quite a monument of what can be done by determination after four years of desperate and ruinous war.—C.R.N.B.

Subscriptions for Vol. XXXI. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 [This subscription includes all numbers published from January 15th to December 15th, 1919.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Ten Shillings, and must be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 Cheques and Postal Orders should be made payable to H. E. PAGE.

ADVERTISEMENTS of Books and insects for Sale, or Books wanted will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14

Subscribers who change their addresses must report the same to Mr. H. E. PAGE "Bertrose," Gellatly Road, New Cross, London; S.E., otherwise their magazines will probably be delayed.

Articles that require illustration are inserted on condition that the author defrays the cost of the illustrations.

All Foreign Exchange Magazines must be forwarded to H. J. TURNER 98 Drakefell Road, New Cross, S.E. 14

Duplicates.—*Dissimilis, Velleda, Fibrosa, *Ambigua, Fulva, *Lubricipeda var. Fasciata, *Plantaginis, Coracina, Captiuncula, Mundana, Lutosa, Togata, *Valerianata, Ciliialis, Inquinatea, Caledonia, Variegana vars. Sauciana, Geminana, Cinerana, Brunnichiana, Schulziana, Congelata, Occultana, Vectisana, Dorsana, Rusticana, *Suboccelana, *Strobilella, Nanana, Herbosana, Petiverella, T. corticella, *Ecop, Fulvigitella, etc. *Desiderata.*—Good Pyrales, Tortrices, etc.—T. Ashton Lofthouse, *The Croft, Lintorpe, Middlesbrough.*

Desiderata.—*Pieris napi*—spring and summer broods with exact data (localities and dates)—from all parts of the Kingdom, especially North of England and Scotland; Parage ægeria from Scotland, Ireland, and North of England—exact data needed. Will do my best in return or pay cash.—G. T. Bethune-Baker, 19, Clarendon Road, Edgbaston.

Duplicates.—Varleyata and other varieties of Grossulariata. *Desiderata.*—Good varieties and local forms. *Spilosoma urticae*, *Advenaria*, and other ordinary species to renew old series. Good Tortrices and Tineae.—Geo. T. Porritt, Elm Lea, Dalton, Huddersfield.

Duplicates.—Grossulariata var. lutea, lacticolor, varleyata, fulvaticata, etc. *Desiderata.*—Other extreme forms of Grossulariata, or good vars. of *Diurni*.—Rev. G. H. Raynor, Hazeleigh Rectory, Maldon, Essex.

Desiderata.—*Euchloë cardamines* from Ireland; also types of *E. cardamines* from Switzerland, Italy, S. France; var. *turritis* (S. Italy), var. *volgensis*, var. *thibetana*, and of *E. gruneri*, *E. euphenoides*, *E. damone*, and any paleartic species of the genus. *Duplicates.*—*Loweia dorilis* and vars., a few minor vars. of *R. phleas* (British), and many British lepidoptera.—Harold B. Williams, 82, Filey Avenue, Stoke Newington, N.

Duplicates.—*A. coridon* vars., including semi-syngrapha, *H. Comma*. *Desiderata.*—*A. coridon* var. *Albicans* (Spanish) and var. *Hispana* (do.), and good butterfly vars., especially from Ireland.—Douglas H. Pearson, Chilwell House, Chilwell, Notts.

Duplicates (all Clydesdale).—*Ethiops*, *Selene*, *Icarus*, *Phleas*, *Hectus*, *Mundana*, *Perla*, *Fulva*, *Nictitans*, *Tritici*, *Chi*, *Boreata*, *Cambrica*, *Belgaria*, *Immanata*, *Olivata*, *Tristata*, *Boreata*, *Mercurella*, *Angustea*, *Dubitalis*, *Ambigualis*, *Truncicolella*, *Derepitalis*, *Kuhmella*, *Fusca*, *Margaritellus*, *Hortuellus*, *Hyemana*, *Phryganella*, *Ferrugana*, *Solandrana*, *Sponsana*, *Conwayana*, *Stramineana*, *Rivulana*, *Urticana*, *Octomaculana*, *Perlepidana*, *Vaccinana*, *Geminana*, *Herbosana*, *Myllerana*. *Desiderata.*—Numerous, especially.—A. A. Dalglish, 7, Keir Street, Glasgow.

Duplicates.—*Janira*, *napi*, *cardamines*, *Artemis*, *P. interrogationis*, *P. festuceæ*, *P. bractea*, *D. conspersa*, *Haslata* (all Irish). *Desiderata.*—*Machaon*, *Artemis* (English), *Cinxia*, *Athalia*, *Cardui*, *Galatea*, *Epiphron*, *Lucina*, *Actæon*, *Sylvanus*, *Comma*. All perfect, well set on black pins.—Charles Langham, Tempo Manor, Co. Fermanagh, Ireland.

CHANGES OF ADDRESS.—E. A. Elliott, 41, Chapel Park Road, St. Leonards-on-Sea. F. N. Pierce, F.E.S., The Old Rectory, Warrington, Oundle, Northants.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. 1919, May 7th; June 4th; Oct. 1st; Oct. 15th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—Meetings: The second and fourth Thursdays in the month at 7 o'clock.—Hon. Sec., Stanley Edwards, 15, St. German's Place, Blackheath, S.E. 3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society).—Hall 20, Salisbury House Finsbury Circus, E.C. The First and Third Tuesday in the month, at 7 p.m. Visitors invited. Hon. Sec., J. Ross, 18, Queens Grove Road, Chingford, N.E.

Communications have been received or have been promised from Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, C. P. Pickett, Parkinson Curtis, H. Donisthorpe, A. Sieh, Dr. Verity, C. W. Colthrup, Rev. C. R. N. Burrows, Dr. T. A. Chapman, Capt. Burr, G. T. Bethune-Baker, E. B. Ashby, P. A. H. Muschamp, J. H. Durrant, Orazio Querci, Major P. P. Graves, Rev. F. D. Morice, H. W. Andrews, Malcolm Cameron, C. Nicholson, W. Daws, Lieut. Box, with Reports of Societies and Reviews.

All MS. and editorial matter should be sent and all proofs returned to Hy. J. TURNER, 98, Drakefell Road, New Cross, London, S.E.14

We must earnestly request our correspondents NOT to send us communications IDENTICAL with those they are sending to other magazines.

Lists of DUPLICATES and DESIDERATA should be sent direct to Mr. H. E. Page, Bertrose, Gellatly Road, New Cross, S.E. 14

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

H. W. HEAD, Entomologist,
BURNISTON, Nr. SEARBOROUGH.

Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

G. A. Bentall, F.Z.S.,

~ NATURALIST. ~

Carton Store Boxes, $15\frac{1}{2}'' \times 10\frac{1}{4}'' \times 2\frac{1}{8}''$, wood sides, hinged lid, covered dark leather paper, lined white inside, prepared cork bottom lining, 3/- each, carriage 6d. extra.

Dustproof white wood double Store Boxes, camphor cells, lined cork top and bottom.

$10'' \times 8'' \times 3''$	$14'' \times 12'' \times 3''$	$17'' \times 12'' \times 3''$
7/9	9/6	10/9 each.
ready end of month.		in stock.

Prepared Cork Sheets, $12'' \times 6''$, 4/6 per doz., 5d. per sheet.

Strong Glass Killing Bottles, fitted with cork bung, 2/- each. Larger size, 2/6 each.

White Tiffany (soft finish) for sleeving, etc. 30'' wide, $10\frac{1}{2}$ d. per yd.

A large stock of **British, Continental, and Exotic Lepidoptera.**

Cheap Type Collections. Entomological Pins, from 1/3 per oz.

Tracing Paper for setting, $30'' \times 20''$, $3\frac{1}{2}$ d. per sheet.

23 only, small glazed **Exhibition Boxes**, 1/- each.

60 cork **Setting Boards**, 6d., 9d. and 1/- each.

ALL GOODS CARRIAGE PAID OVER 20/-.

Price Lists post free on request.

DUDLEY HOUSE, SOUTHAMPTON ST. (opposite Hotel Cecil),
STRAND, W.C. 2.

Subscriptions for 1919 (10/- post free) should be sent to H. E. Page, "Bertrose,"
Gellatly Road, S.E. 14.

Vol. XXXI.

13,820

No. 5.

The Entomologist's Record AND LIBRARY Journal of Variation

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.

GEORGE T. BETHUNE-BAKER,

F.Z.S., F.L.S., F.E.S.

M. BURR, D.Sc., F.Z.S., F.L.S., F.E.S.

(REV.) C. R. N. BURROWS, F.E.S.

T. A. CHAPMAN, M.D., F.R.S., F.E.S.

JAS. E. COLLIN, F.E.S.

H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

JOHN HARTLEY DURRANT, F.E.S.

ALFRED SICH, F.E.S.

(REV.) GEORGE WHEELER, M.A., F.E.S.,

and

HENRY J. TURNER, F.E.S.,

Editorial Secretary.

CONTENTS.

	PAGE.
The Genus <i>Hesperia</i> , Dr. T. A. Chapman, F.R.S. (with three plates)	81
New Species of Staphylinidae from Rhodesia, Malcolm Cameron, M.B., R.N., F.E.S. ..	83
Seasonal Polymorphism and Races of some European Grypocera and Rhopalocera, Roger Verity, M.D.	87
Dwarf Lepidoptera, (Rev.) C. R. N. Burroughs, F.E.S. (with one plate)	89
SCIENTIFIC NOTES AND OBSERVATIONS:— <i>Agriades coridon</i> race <i>vectae</i> , Major P. P. Graves, F.E.S.	90
NOTES ON COLLECTING:— <i>Melanic Arctia caja</i> , W. Daws; The Dragonfly Season, 1918, <i>Id.</i> ; Notes from Bexley, L. W. Newman; Some Field Notes for 1916-17 (contd.), C. W. Col- thurp; Notes from Bexley, L. W. Newman	91
CURRENT NOTES AND SHORT NOTICES	95
SOCIETIES:—The South London Entomological Society	99
OBITUARY:—Frederick Du Cane Godman, G.T.B.-B.; Sydney Webb, H.J.T.	99
SUPPLEMENT (continued) to be completed.	

MAY 15th, 1919.

Price TW. SHILLINGS (NET).

WITH FOUR PLATES.

Subscription for Complete Volume, post free

(Including all DOUBLE NUMBERS, etc.)

TEN SHILLINGS.

TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,

"BERTROSE," GELLATLY ROAD, NEW CROSS, S.E. 14.

Communications have been received or have been promised from Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, C. P. Pickett, Parkinson Curtis, H. Donisthorpe, A. Sich, Dr. Verity, C. W. Colthurp, Rev. C. R. N. Burrows, Dr. T. A. Chapman, Capt. Burr, G. T. Bethune-Baker, E. B. Ashby, P. A. H. Muschamp, J. H. Durrant, Orazio Querci, Major P. P. Graves, Rev. F. D. Morice, H. W. Andrews, Malcolm Cameron, C. Nicholson, W. Daws, Lieut. Box, with Reports of Societies and Reviews.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/5, 2/2, 2/6, 3/2. Folding Nets, 3/9, 4/3, 4/9. Umbrella Nets (self-acting), 7/- . Pocket Boxes (deal), 7d., 10d., 1/2, 1/10. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/- . Nested Chip Boxes, 9d. per four dozen, 1 gross, 2/- . Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/- . Sugaring Tin, with brush, 1/6, 2/- . Sugaring Mixture, ready for use, 1/7 per tin. Store-Boxes, with camphor cells, 2/3, 2/9, 4/- 4/6, 5/6, 6/8. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/- ; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 10/6, 12/9; corked back, 15/9. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/9, 4/6, 5/6, 8/3. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/9 to 11/- . Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, 1/2 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/6. Glass-top and Glass-bottomed Boxes, from 1/3 per dozen. Zinc Killing Box, 9d. to 1/- . Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d., 1/-; Blowpipes, 4d., 6d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families and for all insects liable to become greasy.

We stock various sizes and lengths of these Silver Pins which have certain advantages over ordinary entomological pins (whether enamelled black or silver or gilt).

NESTING BOXES of various patterns which should be fixed in gardens or shrubberies by lovers of birds before the breeding season.

SHOW ROOM FOR CABINETS

Of every description for INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS &c.

Catalogue (84 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic),
Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.

Bexley]

L. W. NEWMAN

[Kent

Has for sale a superb stock of 1918 specimens in fine condition, including Varleyata; Bicuspis; Pendularia var. Subroseata; Melanic forms Lariciata, Consortaria, Consonaria, Abietaria; Irish forms Aurinia and Napi, fine vars. Tiliae, Yellow Dominula, etc., etc. Quotations and Insects sent on approval with pleasure.

Also a huge stock of fine PUPÆ and OVA.

Write for latest price lists.

NOTICE:—Owing to huge rise in cost of metal, etc., my **Relaxing Tins** are now **3/6** small and **5/6** large, post free.

GALLS AND PIERCED BRAMBLE AND BRIER STEMS.—MR.

L. A. BOX would be very grateful for any sorts and quantities, with localities, from all parts of the United Kingdom. **80, Northampton Road, Croydon.**

The Genus *Hesperia*. (With three plates.)

By DR. T. A. CHAPMAN, F.R.S., F.Z.S.

(Continued from vol. xxx., p. 165.)

In leaving the group, if they are close enough to be one group, of *onopordi*, *serratulæ*, and *fritillum*, we might take next the *alveus* group proper, but it may be convenient to take first *cynaræ*, connecting the *cacaliae* with the *alveus* group, and then the *malvæ* group, that seems fairly near to *onopordi*.

Cynaræ, Pl. i., fig. 4. The male appendages (Pl. iii., fig. 1) are very close to *alveus*, and at first glance are of the same group; this is notable in the form of the (*cuiller*) "spoon," and especially of the lateral apophyses, which are almost identical with those of *alveus*, the style, however, though long and slender, has one character that only occurs elsewhere in the *cacaliae* group, *viz.*, it is folded over close to its base, and the stylifer and antistyle are more like those of the *cacaliae* group than like *alveus*.*

Cynaræ is perhaps nearer to *alveus* than any species not of the *alveus* group (*sensu stricto*). It may be distinguished from all other species of the group in the wider sense, by the points noted by Rambur. The species is rather large (36mm.), has very large and very square white spots, more so than in any other species of the group, above the discoidal spot there are the two or three little streaks that occur in most species, but here they are distinctly one after the other in line with the costa, in the others they are rather one above the other. The two little spots on the inner margin, to the basal side of the middle, one or both of which are so often present in other species, are here large and united towards the base so as to present a rather blunt rounded arrowhead directed towards the base. Beneath, the spots on the forewing are very large, as they are above, the spotting on the hindwing presents nothing that can be seized upon to distinguish it from *alveus*, but the inner margin is pale as in *carthami*, and in *alveus* it is quite darkly scaled.

Coming to the *malvæ* group, we see a close relationship in the forms of the apophyses in *malvæ* and *onopordi*, and the short style and squat stylifer in *melotis* and *malvoides* are nearer to the *onopordi* group than to those of *cacaliae* or *alveus*. This brevity is carried to excess in *malvæ*, where the stylar teeth are very large and trespass backwards.

Professor Reverdin places four species in the *malvæ* group, *malvæ*, *melotis*, *malvoides*, and *pontica*. Their relationship to the other groups, is apparently distinctly to what I have called the European section, but in some respects it approaches the Asiatic section more than any other of the European groups. This is perhaps most pronounced in the clasps having the upper and lower margins curved, so that they look as a whole more circular and less elongated and parallel-sided, the clasps also have the stylifer well-marked, but with the style so short and blunt as hardly to deserve the name. *Sao* is much more eastern in these respects than the *malvæ* group, and as regards the appendages appears to belong to a distinct group.

The convex curvature of the lower margin of the clasps in this

* I have felt a want of names for the curious separate-looking portion of the clasp that carries the style (Rambur) and for its basal projection, I think suitable names would be the stylifer and the antistyle.

group is most in contrast with that of the *alveus* group (restricted), in which the large development of the spoon (*cuiller*) gives this margin a concave curvature. To the well-known three species of this group, Dr. Reverdin adds a fourth, a novelty that surprised him; it is founded on two specimens from Asia Minor. He could not clearly decide whether these were *malvae* or *malvoides*, but on examining the appendages found they were completely different from both of these and from his figure of the appendages it seems to be nearer to *melotis*. The three species *malvae*, *malvoides*, and *pontica* (the new species) are therefore hardly distinguishable from each other on naked eye characters, yet the appendages are very different. *Melotis* is easily separable.

I have no specimens of *pontica*, so cannot illustrate it. *Malvae* has the remarkable peculiarity that the uncus consists of two pieces, a right and left, but further they both seem to be movably articulated to the tegmen. No other *Hesperia* has this character, but in *malvoides* the uncus consists of a right and left portion soldered together, along an obvious median suture, and usually there is near the apex an actual space or opening between the two sides, where the soldering is not complete. I have also seen an approach to this median suture of the uncus in *alveus*. The most notable differences; apart from this of the uncus; are in the lateral apophyses of the 10th segment. All these are quite evident in the photographs.

Malvoides was first distinguished by Rambur and named *fritillum*, a preoccupied name, then it was re-discovered by Elwes and Edwards and named *malvoides*; nevertheless for a full account of the species as compared with *malvae*, we had to wait for Dr. Reverdin's monograph in the *Bulletin of the Geneva Society* for 1911, p. 59. In that monograph he called *malvoides*, *fritillum*; *fritillum*, Rbr. He has since sunk this *fritillum* in favour of *fritillum*, Hb., which he accepts as being the *cirsii*, Rbr.

I have already said that I agree with Rambur that the *fritillum* of Hübner is *malvoides*, so far as one can be certain about a rather enigmatical figure. *Malvoides* would therefore be *fritillum*, had that name not previously been given to *cirsii*, Rbr., with the remarkable certitude given by the reference to Roesel's excellent figure.

Dr. Reverdin points out that we are very much in want of a life history of *malvoides* for comparison with that of *malvae* but this does not seem to have been yet supplied. He gives some facts to suggest that *malvoides* is attached to damp places, but this is the only life-history item so far brought forward. He gives various minute points of form of wing, colour, and markings, by which *malvae* and *malvoides* differ from each other, still it remains almost impossible for any one except such a savant as Prof. Reverdin to say certainly to which species any particular specimen belongs. The safest criterion, if the appendages are not to be examined, is the habitat, for the most remarkable and interesting fact brought out in Dr. Reverdin's essay is that both species nowhere occur together, and according to the instructive map he gives, *malvae* is clearly northern and eastern, *malvoides* southern and western, in its distribution. In the alpine region, which has afforded most facts, the map shows one or two localities with *malvae* south of *malvoides*, due probably to local climatic variations; everywhere else

malvoides could be surrounded by a ring fence excluding *malvae*, and even in these alpine habitats the line would not have many salients.

It is perhaps curious to observe that the appendages of *malvoides* are very distinct from those of the other three species, which are not very dissimilar, especially in the apophyses, which are something of the form in *onopordi*. Yet the wing patterns are very distinct in the case of *melotis*, one of the three, and its place is taken by *malvoides*, giving three species hardly distinguishable not only in general facies but in much detail.

EXPLANATION OF PLATES.

Plate I. Undersides of *Hesperia* $\times 2$. Photo A. E. Tonge.

Fig. 1. *H. malvae*.

Fig. 2. *H. malvoides*.

Fig. 3. *H. melotis*.

Fig. 4. *H. cynaræ*.

Plate II. Male Appendages of *Hesperia*.

Fig. 1. *H. melotis* $\times 20$.

Fig. 2. *H. malvoides* $\times 15$.

Fig. 3. *H. malvoides* $\times 15$.

Fig. 4. *H. malvoides* $\times 20$.

Plate III. Male Appendages of *Hesperia* $\times 15$.

Fig. 1. *H. cynaræ*.

Fig. 2. *H. malvae*.

Fig. 3. *H. malvae*.

New Species of Staphylinidæ from Rhodesia.

By MALCOLM CAMERON, M.B., R.N., F.E.S.

The species here described were collected by the late Mr. H. C. Dollman. I am indebted to Mr. H. St. John Donisthorpe for the privilege of examining these insects and for co-types, the types are in the British Museum (Natural History), South Kensington.

1. *Schistogenia dollmani* n.sp.

Ferruginous red, dull, somewhat depressed, abdomen pointed; fore parts coarsely and rugosely punctured; first three or four joints of the antennæ, mouth parts and legs, reddish-testaceous. Length 3.2mm.-5mm.

More brightly coloured than *S. crenicollis* Kr., with more pointed abdomen and average size larger, thorax broader, more strongly impressed on the disc, the antennæ thicker and the elytral sculpture less coarse.

Head transverse; eyes large, moderately prominent, temples parallel, puncturation coarse, close and rugose; antennæ stout with the first three joints of about equal length, the 4th joint a little longer than broad, the 5th to the 10th transverse gradually increasing in breadth, the 11th conical, about as long as the two preceding together.

Thorax twice as broad as long, the anterior border broadly emarginate, the anterior angles acute, the base deeply bisinuate, the sides moderately rounded and crenulate, slightly sinuate before the posterior angles which are acute, the disc broadly and deeply impressed for nearly the whole extent in the middle, with a less distinct rounded impression between this and the posterior angles, and an oblique impression at the anterior border on either side; sculpture similar to that of the head.

Elytra as long as, but narrower than, the thorax, transverse, strongly emarginate internal to the postero-external angles, the sculpture consisting of moderately coarse and close granules.

Abdomen pointed, the bases of the first four visible segments crenulate, for the rest very finely and closely punctured and pubescent throughout.

Hab., Namwala, June 19th, 1914.

Myrmedonia robusta n.sp.

Robust, convex, navicular, shining, pale reddish-ochraceous, the head pitchy brown behind the level of the antennal tubercles. Antennæ compressed, ferruginous, mouth parts and legs reddish-testaceous. Length 10mm. Breadth 4mm.

Head transverse, constricted behind, the neck broad, the eyes large and prominent, the mandibles produced and falciform, the right one with a small tooth at the middle of the inner border; front between the insertion of the antennæ strongly raised, the vertex somewhat depressed transversely; sculpture consisting of a very few fine punctures near the eyes and a very fine and indistinct ground sculpture. Antennæ as long as the head and thorax together, all the joints (except the 1st) compressed, the 2nd a little shorter than the 3rd, the 4th to the 10th all a little longer than broad, gradually decreasing in length, the 11th conical shorter than the two preceding together.

Thorax nearly twice as broad as long, widest at the junction of the middle and posterior thirds, the sides from thence strongly rounded and narrowed to the obtuse anterior angles, feebly sinuate in front of the posterior angles which are rectangular, the base bisinuate; disc with trace of median line, the sides broadly impressed throughout; the lateral margins raised, puncturation very fine and very sparing; ground sculpture exceedingly fine transversely retiform; pubescence very sparing, erect.

Elytra as long as, but broader than, the thorax, transverse, strongly sinuate internal to the postero-external angle, puncturation very fine and sparing, pubescence erect consisting of longer and shorter hairs; ground sculpture very finely coriaceous.

Abdomen narrowest behind, the side margins much elevated, practically impunctate and glabrous. Tibiæ compressed.

♂: 8th dorsal segment with the posterior border broadly rounded and obscurely crenulate; 6th ventral segment produced, broadly and very slightly emarginate posteriorly.

Hab., Mumbwa, September 2nd, 1913. Flying in a room at night.

Myrmedonia dollmani n.sp.

Reddish-ochraceous, scarcely shining, the head behind the antennal tubercles, black; abdomen ferruginous; antennæ, mouth parts and legs reddish-testaceous. Length 8mm. 11.3mm.

Head black with greasy lustre only; the front reddish-testaceous and more shining, longitudinally elevated in the middle line; the vertex with a fine impressed line not extending as far as the posterior border; the sculpture consisting of minute (and by no means close) granular elevations, each bearing a yellow hair, and a dense coriaceous ground sculpture. Antennæ of the length of the head and thorax together, the 2nd joint fully half as long as the 1st, the 3rd to the 7th longer than broad, gradually decreasing in length and slightly compressed, the 8th to the 10th scarcely longer than broad and also slightly compressed, the 11th oblong, fully as long as the two preceding together.

Thorax strongly transverse, widest at the middle, the sides rounded from base to apex, but rather more narrowed in front, the anterior angles rounded, the posterior obtuse; disc with a fine impressed line in the middle and a transverse fovea before the scutellum; the sides broadly impressed throughout, the lateral margins raised: sculpture and pubescence similar to that of the head.

Elytra broader and a little longer than the thorax, transverse, with similar sculpture to that of the head but closer and stronger.

Abdomen more shining and more reddish than the fore-parts, very finely, sparingly and asperately punctured, yet more sparingly on the 7th and 8th segments.

♂: head on either side of the vertex with a large crateriform setiferous pore; thorax broader and the sides more rounded than in ♀. 3rd dorsal segment of the abdomen with the posterior border produced, raised and broadly emarginate, the emargination bounded by a short blunt tooth on either side; 4th with a tubercle in the middle; 5th with a small tubercle on either side close to the lateral margin; 7th with a tubercle immediately in front of the posterior margin in the middle and longitudinally impressed laterally; 8th with a tubercle in the middle, the posterior margin obscurely crenulate in the middle.

Hab., Kashilu, at light.

Myrmedonia donisthorpei n.sp.

Ochraceous, the head ferruginous, scarcely shining; antennæ, mouth parts and legs reddish-testaceous. Length 12.5mm.

♂: head large transverse, eyes large and prominent, the front between the antennal tubercles elevated, the disc anteriorly narrowly impressed in the middle, and with a large crateriform setiferous pore on either side; punctuation fine, asperate, and by no means close, each puncture with a yellow hair; ground sculpture fine but distinct, for the most part forming longitudinal reticulations. Antennæ as long as the head and thorax, laterally compressed from the 3rd joint, the 2nd joint one-third shorter than the 1st, the 3rd longer than the 2nd, the 4th to the 10th differing but little in length or breadth, subtriangular when seen from above and slightly longer than broad, the 11th conical, as long as the 10th.

Thorax strongly transverse, widest about the middle, the sides slightly rounded from base to apex, more strongly narrowed posteriorly to the obtuse but prominent posterior angles, the anterior angles rounded; disc with impressed median line and a small transverse fovea before the scutellum; the sides broadly impressed throughout, the margins elevated; sculpture and ground sculpture much as on the head, but the former distinctly closer.

Elytra broader and a little longer than the thorax, transverse, pretty closely, finely, and somewhat asperately punctured, the ground sculpture indistinct.

Abdomen more shining than the fore-parts, finely, rather sparingly, and superficially punctured, especially posteriorly, ground sculpture fine, transversely strigose. 3rd dorsal segment with the posterior border a little produced and elevated, broadly emarginate in the middle, the emargination bounded by a blunt tooth on either side; 7th dorsal segment longitudinally impressed on either side, and with a transverse row of 6 or 7 obsolete tubercles a little in front of the posterior margin; 8th dorsal segment with a row of 5 tubercles across the middle, the central one being the most distinct, there are also a few scattered granules near the posterior border, which is truncate in the middle and obscurely dentate on either side.

♀ unknown.

Hab., Kashilu.

Myrmedonia spatha n.sp.

Black, the fore-parts with greasy lustre only, the abdomen more shining; thorax red, the base of the elytra sometimes red; the first and sometimes the first three visible abdominal segments more or less dull red. Length 8mm.-9mm.

Head transverse, black, very finely and rather sparingly punctured, in the ♀ rather more shining and often broadly impressed anteriorly; ground sculpture distinct and coriaceous in both sexes. Antennæ as long as the head and thorax, the 2nd joint half as long as the 3rd, the 3rd and following compressed, the 5th to the 10th differing but little in length and breadth, and about as long as broad.

Thorax red, subquadrate, scarcely broader than long, widest before the middle, the sides rounded and narrowed anteriorly to the rounded angles, more strongly contracted and very slightly sinuated posteriorly to the rounded posterior angles; disc with an obscure fovea before the scutellum and with a trace of median impressed line often abbreviated in front, exceedingly finely and exceedingly sparingly punctured, ground sculpture distinct, coriaceous.

Elytra broader, and a little longer than, the thorax, transverse, the base often more or less red, very finely, obsoletely, and sparingly punctured, distinctly coriaceous.

♂: 3rd dorsal segment with a small triangular emargination of the posterior border in the middle line, the postero-external angles produced into a narrow, laterally compressed, elongate spatulate process extending nearly to the level of the posterior margin of the 5th segment, parallel and external to, the sides of the abdomen, and gradually and slightly widened towards the apex, which is rounded. 6th segment with a small pointed tubercle in the middle, a little behind the centre. 8th segment with four equidistant tubercles at the posterior border.

Hab., Mwengwa, July 30th, 1913, Namaula, August 15th, 1914.

Myrmedonia rhodesiana n.sp.,

Narrow, elongate, parallel, black, shining; the thorax, base, and more or less

of the shoulders of the elytra, 2nd, 3rd, 4th, base (and sometimes the apical margin of the 5th) abdominal segments red. Antennæ ferruginous, the first two joints, mouth-parts, and legs reddish-testaceous. Length 6mm.-8.75mm. A brightly coloured species. Smaller and narrower than the preceding and more brightly coloured.

Head transverse, black, exceedingly finely and sparingly punctured, distinctly but finely coriaceous, in the ♂ with a small tubercle between the base of the antennæ. Antennæ as long as the head and thorax, the 2nd joint shorter than the 3rd, which is compressed, the following joints not compressed, the 4th scarcely broader than long, the 5th to the 10th transverse, gradually and slightly increasing in breadth, the penultimate about twice as broad as long, the 11th conical, a little longer than the two preceding together.

Thorax red, scarcely transverse, widest just behind the anterior angles which are rounded, the sides narrowed and a little sinuate to the obtuse posterior angles; the surface without impressions or foveæ, exceedingly finely and sparingly punctured, finely coriaceous.

Elytra black, the base and humeral angles red, broader and slightly longer than the thorax, slightly transverse, scarcely sinuate at the postero-external angles, very finely and sparingly punctured, finely coriaceous.

Abdomen yet more shining than the fore-parts, with a few fine punctures on the first three or four segments, the rest practically glabrous.

♂: head with a small tubercle between the insertion of the antennæ. 3rd dorsal segment of the abdomen with an obsolete tubercle in the middle of the posterior border, postero-externally produced into a long pointed spine extending a little beyond the level of the posterior margin of the 4th segment external to the abdominal margin, or with a shorter spine not quite reaching the posterior margin of the 4th segment and lying internal to the abdominal margin. 7th segment with a row of four small equidistant tubercles transversely placed across the middle. 8th segment with a transverse row of four tubercles near the base, the posterior margin with four tubercles, the external angles presenting a small tooth.

Hab., Mwingwa, with Termites, May 1st, 1914.

Myrmedonia seminigra n.sp.

Elongate, subparallel, black, moderately shining; the front of the head, thorax, elytra, extreme apex of the abdomen, mouth-parts, and legs rufo-testaceous. Antennæ ferruginous. Length 7.3mm.-8mm.

Head transverse, black, in front of the antennal tubercles, reddish; in the ♂ with a greasy lustre only, more strongly coriaceous; in the ♀ shining with much finer coriaceous ground sculpture; the puncturation in both sexes moderately fine and sparse. Antennæ stout, the 2nd joint shorter than the 3rd, which is compressed, the 4th to the 10th strongly transverse, the penultimate nearly three times as broad as long, the 11th conical, longer than the two preceding together.

Thorax slightly transverse, subquadrate, widest just behind the rounded anterior angles, the sides contracted posteriorly in a nearly straight line to the rounded posterior angles; disc without impressions; in the ♂ less shining and more distinctly coriaceous than in the ♀, puncturation moderately fine and not very close, but closer and more distinct than that of the head.

Elytra as long as, but broader than, the thorax, transverse without sinuation at the postero-external angles, puncturation of the same size but closer and more superficial than that of the thorax, evanescent towards the posterior part of the sutural region; ground sculpture very fine, coriaceous.

Abdomen elongate, parallel, black, shining, the apex of the 8th segment rufescent, the 3rd and 4th segments moderately, finely, and sparingly punctured, the rest much more finely and sparingly punctured.

♂: dorsal plate of the 3rd segment produced and slightly elevated, broadly emarginate; the postero-external angles of the segment produced backwards either as a strong, laterally compressed spine, parallel and external to the 4th segment, to the level of the posterior margin of which it extends, and separated from the central plate on either side by a semicircular notch, or only produced into a short, stout pointed tooth, lying internal to the lateral margin and extending very little over the 4th segment; 7th segment with a transverse row of four tubercles of which the central are the largest, placed behind the middle, and another row of small tubercles between these and the posterior margin. 8th segment with a row of four tubercles transversely placed across the middle, posterior to these with a

tubercle on either side near the lateral margin, the posterior margin with four short, stout teeth.

Hab., with Termites.

Seasonal Polymorphism and Races of some European Grypocera and Rhopalocera.

By ROGER VERITY, M.D.

(Continued from page 48.)

Gonepteryx cleopatra, L., race EUROPAEUS, Vrtý., second gen. SECUNDA, mihi, and third gen. TERTIA, mihi. The three colours of the underside produce three forms, according to their proportions: when blue and yellow exist in the radial area of the forewings and on the hindwings, a vivid green colour is produced, darker than the yellow ground colour of the former in the male (form VIRIDA, mihi); when blue alone exists these areas are bluish-white and lighter than the yellow (form CAERULESCENS, mihi); when yellow alone exists the whole surface is of a uniform colour (form *italica*, Gerh.); the female forms corresponding to the two first mentioned are similar (bluish-white) on account of the absence of yellow; the female of *italica* is for the same reason entirely white; another form of the two sexes is due to the appearance of a reddish ochreous tinge, as in *ochracea* of *ramni* (form OCHREATA, mihi). Seasonal polymorphism consists in different proportions of individuals of these forms: in Tuscany *caerulescens* predominates in all the broods; *virida* is only found in the first; *italica* in about a quarter of the individuals of the second and third, a few amongst them showing the *ochreata* character.

*Colias croceus**, Fourc. Some specimens of the Tuscan first brood are identical with *chrysotheme*, Esp., except for the patch of androconial scales in the male (form CHRYSOTHEMEFORMIS, mihi).

Leptidea† sinapis, L., race NIGRESCENS, mihi. I found this remarkable local race in the marshes near the mouth of the Arno; I only know the first brood. The black markings of the base and apex have an extent which I have never seen even in single individuals of other localities.

Pontia daplidice, L., race EXPANSA, mihi. In some Tuscan localities the individuals of the second (June) brood reach an enormous size (usually 43-44mm. in expanse, and often over 45mm.); I should call this form *expansa*, extending the name to the race which produces it. In Sicily the most distinct race of this species is produced; it is also the finest on account of its large size and very bright colouring; in a series of the II. generation from S. Martino (May 15th-30th) the largest males reach 49mm. and the ♀ 53mm. I call it AMPLA.

Pieris napi, L. The name OCHREATA, mihi., is necessary to designate the *napaeae* female form with a bright ochreous underside ground colour.

* *edusa*.—H.J.T.

† *Leptosia*.—G.W.

Pieris manni, Mayer, race *CRETA*, mihi. Corresponds to *expansa* of *P. daplidice*, and occurs in particular localities, such as Mount Fanna, near Florence, and the Isle of Elba. Males range up to 44-45mm. in expanse, females up to 41mm.

Pieris brassicae, L. The third brood has intermediate characters between the first and the second *catoleuca*, Röbr.; the name *TERTIA* seems the simplest to use, as in other species. The name *POSTICE-ochreata* will be found useful for female individuals of the first brood with the upperside of the hindwings of a bright ochreous colour; they occur frequently in northern races (Britain included), but I have never seen a southern specimen.

Aporia crataegi, L.—Also in this species the northern yellow female called *flava* by Tutt does not occur in the southern races, but specimens with an ochreous underside are not infrequent and might be called *INFRAOCHREATA*, mihi.

Parnassius apollo, L.—On the Prato Fiorito Mountain, near Lucca, a remarkable form is comparatively frequent, in which the ocelli are very large and the anal streaks much more broadly red and rounded than in *decora*, Stichel; the name *DECORATISSIMA* is well suited to them, and the entire race might bear the same name.

*Thais hypermnestra**; Scop., race *NEMORENSIS*, mihi, and race *LATEVITTATA*, mihi.—In the pine woods of the Tuscan coast (Forte dei Marmi), a small, weakly race is found, contrasting with the large, bright *cassandra*, Hüb., of open Tuscan localities. The latter is identical with Hübner's figures, and I was wrong in figuring it in "*Rhopalocera palaeartica*" under the name of "trans. to *cassandra*," and in naming the very dark Sicilian race *cassandra*. Hübner's name should not be applied to the latter, as all authors have done, and a new name is necessary to distinguish it from true *cassandra* of Central Italy; I propose that of *LATEVITTATA* as being descriptive; figure 16 of pl. vii. can be taken as the "type." Hübner's figures of *cassandra* show red scaling in the precostal markings of the forewings; specimens in which it does not exist might be called *INORNATA*.

Papilio machaon, L., race *BIGENERATA*, mihi; race *EMISPHYRUS*, mihi. This species does not produce numerous local races in Europe, but geographical variation does exist on broad lines, according to the latitude. (1) In the north flies the nymotypical single-brooded race, including a few local ones, such as the English race. (2) Further south there are two broods,† and the second one is intermediate in character between the first and the form *aestivus*, Z., which exists still further south; it has the short-haired frontal tuft and partly bare abdomen of the latter, but the wings differ little from those of its first generation. It is well worthy of being distinguished, and might be called *AESTIVOIDES*, mihi. This race on the whole might be called *BIGENERATA*, mihi. (3) Proceeding southwardly one meets with three broods: in this group the culminating race is the one of the extreme south

* *polyxena*.—H.J.T.

† There are two broods in England.—G.W.

(Sicily), whose first generation was well figured by Hübner under the name of *sphyrus*, and whose second and third, similar to each other, were accurately described by Zeller in 1847 and named *aestivus*. Less far south one meets in the greater part of Southern Europe with a tri-generate race or group of races, which are transitional between *bi-generata* and *sphyrus* in both spring and summer. The first brood is larger, brighter, of a deeper yellow and with a more extensive black pattern than that of *bigenerata*, but far from so extensive as in *sphyrus*; the second and third are on the whole similar to *aestivus* from Sicily, but never so large as the extreme individuals of the latter and they never produce the forms *angulata*, Vrtý., and *zancleusoides*, Rag., which occur in Sicily; I propose the name of *emisphyrus* for this race, more generally distributed in the south of Europe, taking as typical form the first brood of Florence.

(To be continued.)

Dwarf Lepidoptera. (With one plate.)

By the REV. C. R. N. BURROWS, F.E.S.

A little time ago Mr. A. A. W. Buckstone submitted to me some very tiny specimens of *Agriades coridon* which he had taken upon a hilltop in Surrey. These insects were captured in July, 1917, and were exhibited at the meeting of the South London Entomological and Natural History Society on October 11th of the same year.

I was very pleased to have these specimens, as they promised to help me to answer a question which had forced itself upon me in the course of my investigations of the genitalia of the *Psychidae*. In that group, and more or less elsewhere, the point has had to be decided as to how far size and development may vary in a single species, and how far the size of the genitalia agrees with the size of the insects to which they belong.

I therefore made preparations of males of these specimens, and compared them with preparations of the normal sized ones. I did the same with two other species, extremely small specimens of which were to hand. I now present the result of my examination. The drawings profess to be merely outlines, but are all made to exactly the same scale. I have left out the spines and hairs as likely to confuse the matter. The normal sized insects are figured to the right of the Plate, the dwarfs to the left. I quote the average size of normal specimens from Meyrick's "Handbook":—

Vanessa io 58.68 mm. The dwarf measures about 47 mm.

Agriades coridon 30.37 mm. The dwarf from the hilltop measures 25 mm.

Mr. Buckstone found a rather better developed form at the bottom of the same hill, and adds in his letter to me: "Besides these, full-sized *coridon* occurs generally over the entire slope, but appears later than the smaller forms, and may be found when the other two forms are over." My specimen measures about 28 mm. and is figured in the centre of the Plate. (Plate iv.)

Abraaxas grössulariata 36.43 mm. The dwarf measures about 30 mm.

My dwarf specimens are therefore well below the minima given by Meyrick. Now, do the genitalia exhibit the same difference in size

which exists in the wingspread of the insect itself? I think that we must acknowledge that the difference which exists is very much less than we should have expected.

These dwarf insects are doubtless starved more or less. Evidently in the *A. coridon* from the hilltop and bottom the food supply has been very short. The insects have been able to develop, but are dwarfed. Mr. Buckstone notes that the small males were not ever found paired, although the normal sized ones were often so found. The normal males paired with the dwarf females. Evidently in this case, although the male organs appear to be complete, the insects lacked vigour or power to copulate.

It is evident that the genitalia do vary with the size of the specimen, but not at all in the degree which we should be inclined to expect. I feel that I am not much more forward than I was before, only I see that it behoves one to be careful about distinguishing species by measurement alone.

My drawings may perhaps interest some who have never looked into the subject of genitalia, when they observe that the organs of a little butterfly like *A. coridon* are very much larger than those of a big species like *V. io* and than those of *A. grossulariata*.

SCIENTIFIC NOTES AND OBSERVATIONS.

AGRIADES THETIS RACE VECTAE, VERITY.—With reference to Dr. Verity's account of this form may I give a few notes as to a series of 27 ♂s and 9 ♀s of *A. thetis*, which I took on the downs above Ventnor, Isle of Wight, in the first week of September, 1913. These specimens do not altogether agree with Dr. Verity's description. The race is on the whole small. The blue of the males does not appear to me to differ from that of the few other British specimens in my possession, though it is certainly of a brighter and more sky blue tint than the blue of males from N.W. Asia Minor. Nine only, exactly 33 per cent., have premarginal black dots at all on the inferiors. The females are dark and small, with little or no blue scaling on the bases of the wings. Four are almost or quite destitute of orange lunules, and all show traces of blue on the marginal side of the submarginal black spots on the inferiors. On the under-side both sexes are dark, but not I think darker than the average of English specimens, which have a much darker underside than my specimens from Asia Minor. In only one specimen are both the basal black dots of the anterior wings absent. In 14 others, among them 5 females, the lower of the two black basal dots is absent or more often obsolescent. The orange lunules are more often bright than pale. The Ventnor race in its second brood of 1913 certainly seems to me to approach the normal British form of *thetis* much more nearly than to *vectae* as described by Dr. Verity. One wonders whether there were any special climatic features about the spring of 1875 which would perhaps explain the abnormality of the series then taken by the late Conquest at Ventnor.—P. P. GRAVES (Major), G.H.Q., British Force, Constantinople. March 18th, 1919.

NOTES ON COLLECTING, Etc.

MELANIC ARCTIA CAJA.—In the first week in May, 1918, my friend Mr. Charles Oliver, linesman on the Midland Railway, who collects the large and more showy British Lepidoptera and the large foreign Silk-worm Moths, found a fine batch of *A. caja* larvæ about full fed and they all pupated a few days after they were taken. He kindly gave me about a dozen pupæ; the first imago emerged on June 5th, and they continued to emerge until June 20th, and all were normal specimens. I got one small batch of ova from a ♀ that paired up. These proved fertile, part of the larvæ fed up quickly and pupated. On looking into my breeding cage at mid-day on October 11th there were no imagines out, but on looking into the cage in the evening I found that two had emerged, both types, and one melanic specimen, but I am sorry to say that this last one had not got clear from the pupa case with the points of the forewings which has somewhat crippled it. However, by spending some time over it, I have made it worth keeping for my collection. The remainder continued to emerge until October 23rd. Part of the larvæ are hibernating. I also obtained a batch of ova from the second brood which produced the melanic specimen, and I hope to get some of the third brood through until breeding time in spring.—WILLIAM DAWS, 39, Wood Street, Mansfield, Notts.

THE DRAGON-FLY SEASON, 1918.—For several years I have been trying to form a collection of Dragon-flies as a side line; I have at times had fair luck with them when Lepidoptera were not much in evidence, but I think that 1918 was the worst season that I have experienced since I collected Dragon-flies. I have traversed more likely places this season, 1918, both in the County of Notts and in that of Derby than I have done in previous years, but with less luck, I walked miles along stream sides and ponds in Derbyshire but never saw traces of a single specimen, either large or small. In Notts I only saw one species and that was *Æschna juncea*. I saw one on two different days on the freshly watered street, but whether they were different specimens or the same insect I cannot of course say for certain. My son brought me another specimen of *Æ. juncea* caught in the moulding shop of a local foundry, another specimen boarded a tram-car without paying his fare, to the fright of the passengers, but the conductor knowing it could not harm him, quickly made him a prisoner and he has now got his ticket in my collection. My son says that on his fishing excursions to the Trent at Fiskerton during 1918 *Calopteryx splendens* occurred in hundreds along the river side; they could be easily taken with their fluttering feeble flight, but he did not trouble to take any, my series being complete of Nottinghamshire specimens.—WILLIAM DAWS. February 17th, 1919.

NOTES FROM BEXLEY.—Here the lateness of the spring has been a record. The weather for the last fortnight was characterised by rain, hail, snow and frost, with hardly any sun. The first blackthorn in bloom was seen on April 30th. *Dimorpha versicolora* is still emerging in my cages. As yet I have seen no sign of *Celastrina argiolus* on the wing. The only butterfly (not hibernated) so far seen was one *Pieris*

brassicæ near the hot-house, possibly from a pupa which was in a somewhat warmer spot. Not a single *Saturnia pavonia* has emerged in my cages, although in a case with glass roof facing south. *Brepheus parthenias* is still about, there are seven females in my breeding cages to-day. The ash trees still have their winter aspect and many birches have only small buds. Yet in spite of the weather our two early-leaving oaks in Bexley Wood are in full leaf. On April 10th they were quite forward enough to feed larvæ with. These two trees are always three weeks to a month earlier in leaf before any others. *Arctia villica* larvæ are still in their black winter coats whereas usually all have pupated ere this. Many *A. carya* larvæ are no larger than before hibernation, and still in the same instar.—L. W. NEWMAN, Bexley. May 1st.

SOME FIELD NOTES FOR 1916-17 (contd).—On the 19th June, 1917, I found a dark *Triana psi* on a fence at Epsom, and *Hecatera serena* started emerging, of which the larvæ were taken at Eastbourne in the previous year.

On the 25th June I boxed a ♀ *Acidalia aversata* off a fence at Dulwich, which laid ova on the following day, and which duly hatched on the 5th July.

On the 28th June I discovered a pair of *Phalera bucephala in cōp* on a fence at Dulwich, a species not very often seen in the imaginal state. The ♀ laid one batch of ova on the 29th and another on the 30th.

On the 5th July I took a ♀ *T. psi*, a ♀ *Boarmia repandata*, and a ♀ *Aplecta nebulosa*, off a wall at Crawley, Sussex, and also a cocoon of *Malacosoma neustria* from under a coping.

On the 6th July the first two *Tephrosia bistortata*, both pale ♀s, emerged, the produce of the pale ♀ taken at Midhurst, Sussex (May 1st). On the 7th I netted a specimen of the Currant Clearwing, *Aegeria tipuliformis*, in my garden, and found larvæ of *Xanthorhoe fluctuata* feeding on turnip leaves. On the 9th July I discovered ten larvæ of *Smerinthus ocellata* of varying sizes, and some fresh laid ova on a dwarf apple tree, and also some larvæ of *T. psi* with two *Abraxa grossulariata* at rest, and a nest of field mice, all in my garden. Larvæ and ova of *Pieris rapæ*, *P. brassicæ*, and *Barathra brassicæ*, besides other garden pests, were particularly plentiful just now, and some extremely interesting, so that having taken up kitchen gardening on account of the war, I found it very difficult often to make up my mind whether I was a gardener or an entomologist. On the 12th July I saw the first *Celastrina argiolus* of the 2nd brood at Dulwich, and the first *P. rapæ* of the summer brood emerged, a ♀ from green pupa, and on the 13th another from a dark pupa spun up at the same place and under identical conditions. On the 13th July I went to Bournemouth for a three months' stay, and the first insect that forced itself on my attention was a "July Bug," a number of which were flying on the cliffs. *P. bucephala* ova (laid 29/6/17), hatched to-day, and *B. brassicæ* larvæ were now going to earth. These spun an earthen cocoon and eventually turned to a reddish pupa, but to my surprise all the *brassicæ* pupæ went over the winter. This was caused by the fact that the last time I bred the species, in 1899, I found a pair *in cōp* at Walmer, Kent, on the 22nd June, the resultant larvæ I fed up on

lettuce, and the images emerged 5 on the 14th, 2 on the 15th, and 1 on the 16th August of the same year. The specimens were smaller and much paler than the original pair. I see by South's "British Moths" that I ought rather to have been surprised in 1899. It would be interesting to hear the cause of this modification of habit in this species.

On July 16th, at Bournemouth, *Zygaena filipendulae* were well out, and *Hipparchia semele* ♂s and ♀s were plentiful and in the best possible condition.

On July 17th I had a day in the New Forest, at Hollands' Wood, and Ramnor enclosure. It was a very warm morning, with the sun partially obscured at times, and evidently the kind of morning to induce mating among the butterflies.

I have already published my observations on paired *Dryas paphia*, and although I was able to observe the courting flight, I did not observe the actual pairing. In the courting flight, the ♀ flies along in a fairly direct line, the ♂ flying close behind in a dancing up and down flight, with a rise of about six inches, or else he flies round her tail in a circle of about six inches diameter, from right to left.

The *Cicada montana* were singing everywhere in the trees—gentle trilling, rather high pitched notes.

I came across a spider's web over bracken, attached by one thread to a branch of an oak tree 30ft. up, another thread attached to a hawthorn branch 6ft. up, and by a third to a branch of bracken near the ground, a most formidable looking affair, and I could but admire the diligence of the creature that made it, and regret that I had not been a witness of the performance.

Gonepteryx rhamni ♂s and ♀s were in perfect condition as they passed in a continuous stream down the ride, feeding on the bramble flowers on the way.

Aphantopus hyperantus were just coming out, and only one *Aglais urticae* was seen—feeding on flowers of ragwort.

A leaf-cutter bee was very busy, and so were a number of specimens of the New Forest fly, much to my annoyance, to say nothing of the smaller fry that kept up a continuous buzz round one's head. In the afternoon, when the sun was partially obscured, *Epinephele jurtina* and *D. paphia* amused themselves by sunning on the gravel road, or else wandered lazily about feeding on the bramble flowers, but *G. rhamni* had disappeared entirely. One or two hornets were careering about, and a ♂ *Opisthagraptis crataegata* was observed flying.

A specimen of a sawfly emerged to-day, the larvæ were feeding on my rose trees at Dulwich, and this particular larva pupated on June 30th. That the House Sparrow does a deal of good in the garden, was borne out to-day by my watching at close quarters some of these birds clearing insects off peas, and I also watched sparrows in my garden at Dulwich clearing out the larvæ of *Pyrausta nivalis* from the terminal shoots of mint, and off apple leaves. I also bred parasites from these larvæ which I will enumerate later.

On July 20th, *P. purpuralis* started emerging, and I paid a visit to a piece of heath near Bournemouth. "Cabbage Whites" were now out in numbers, flying over the fields, sowing the seeds of the destruction that eventually took place in the cabbage fields of the south of England, which I have already reported (*Ent. Record*, vol. xxix., Dec. 1917).

Epinephela jurtina, *Pyronia tithonus*, and *Coenonympha pamphilus*, were feeding on thistles, and *Camptogramma bilineata* was frequently disturbed from the undergrowth. *Plebeius aegon* were flying, some worn, others fresh out, and I took a ♀ underside ab. in which the spots at anal angle of hindwings were formed into an arch, and a ♂ underside ab. in which the two spots on the costal margins of hindwings were joined together, making a long blotch. *Rumicia phlaeas* were out in numbers, and perfectly fresh. I took a number of specimens suffused with blackish, two of which had the spots on both upper and undersides of forewings radiated, I also took a pale coppery specimen, and another with red band on the hindwing much reduced. Another brood appeared in September, in which the spots on the forewings were very much reduced. *Hipparchia semele* was now out in abundance, some worn, while others were quite fresh. I have never seen this species so plentiful anywhere else, except at Swanage. It is a most pugnacious species, driving off any butterfly that comes near it, including even specimens of *Argynnis aglaja*. At this particular spot, there were crowds of Sand Martins wheeling about all day long, leaving their nesting holes, close by, and every time a bird came near where a *semele* was resting on the ground, the butterfly flew up as if to drive the bird away. I found them very active in the morning sunshine, flying with a Vanessid-like flight from flower to flower of the heath, or taking flights over the sea. When alighting on a flower, and while feeding, they keep their wings closed, after the manner of *Colias edusa*, *C. hyale*, and *G. rhamni*. In the afternoon, they love to rest on paths or patches of bare earth to sun themselves, with their wings closed and tilted at an angle away from the sun, every now and then rising into the air and indulging in mock combat with the individual next to them on the path. I followed one path for at least two miles one afternoon, and found specimens about every four or five feet along the whole length of it. The majority work their way down into the clumps of heath or heather to sleep, while others settle on the miniature cliffs of yellow sand, with or without overhanging heather, and rest more or less flat against the face of the sand; others rest in the entrance to rabbit burrows, in fact, their resting habits are very similar to those of *Gnophos obscurata*, which occurs on the same ground, and it was by beating for the latter, in the early evening, that I discovered where the former rested. *G. obscurata* often owed its escape to the momentary distraction caused by the scuffle and flight of *H. semele*.

On the particular path mentioned above I watched a wood ant carry off a ♀ *P. aegon*, and a large ichneumon fly, which I have not been able to identify yet, was common hunting for prey, and I also saw a "Tiger Beetle."

On July 23rd I again visited the heath near Bournemouth, and found a batch of *Aglais urticae* larvæ feeding on nettles, which were quite small. *P. aegon* and *R. phlaeas* were sunning on rushes in the late afternoon, and a specimen of *Z. trifolii*, fresh out, was also resting on a rush. A diligent search on two or three subsequent visits failed to locate the colony. At 7.30 p.m. I located my first *G. obscurata*, a melanic form at rest on a miniature cliff of yellow earth, where it was quite conspicuous to anyone searching for insects, and I soon found a number of others, and started others from the tufts of heather by

gentle tapping, all of the melanic form, and in splendid condition. I also tried the mouths of rabbit burrows, by rattling a small twig in them, when the moths, mostly ♂s, flew out. I then searched the mouths and found that freshly emerged ♀s were still at rest. (*To be continued.*)—C. W. COLTHRUP.

NOTES FROM BEXLEY.—Up till to-day, May 8th, still no *S. carпинi* have emerged. On May 7th I took an example of *Stanropus fagi* in the open. On May the 4th the swallow and the swift were noticed here for the first time this year, the house martins (seven or eight) were seen on April 27th. The first *Celastrina argiolus* was seen on May 4th, as also the first *Strenia clathrata*. The nightingale appeared on the 3rd of May. *Callophrys rubi*, in small number, and also one or two *Euchloë cardamines*, males, appeared in to-day's beautiful sunshine.—L. W. NEWMAN, Bexley. May 8th.

CURRENT NOTES AND SHORT NOTICES.

WICKEN FEN FUND.—Now that restrictions as to light and photography are no longer needed, and opportunities for nature lovers increase week by week, no doubt many more will be able to avail themselves of visiting the above historic ground, now made open to the public for ever by the National Trust. Still that is not all. To provide a watcher to protect the plants and wild life from unworthy depredators, both native and foreign, needs funds, and for this purpose we make an appeal to our readers to contribute their mites to the Hon. Treasurer, Mr. W. G. Sheldon, Youghreave, S. Croydon. In his letter to me Mr. Sheldon says that a further small area has just been added, and we may feel assured that as opportunity occurs no doubt other portions will be acquired.—H.J.T.

The *Irish Naturalist* contains a series of "Entomological Notes from Donegal, Fermanagh and Armagh," dealing with Lepidoptera, Coleoptera and Odonata. We note that *Melitaea aurinia* was "in numbers on the heathy bogs," a specimen of *Agriopsis aprilina*, "which I had not met with before," was taken. Cases of a Coleophorid were picked from sawallow, and a nice series of *Coleophora anatipennella* were obtained. *Bupalus piniperda* was also a fresh species to the district. Among Coleoptera, *Carabus clathratus*, and a white form of *Philopodon geminatus* were taken; *Cicindela campestris* "was very much in evidence," and *Athous hirtus* was an addition to the Irish List. In the Odonata *Lestes sponsa*, *Orthetrum coerulescens*, and *Sympetrum striolatum* were perhaps the most noteworthy captures.

Among recent publications by the Imperial Department of Agriculture in India, are the following memoirs from the *Agricultural Journal of India* (insect pests):—

(1) Vol. v., No. ii. Indian sugar-cane leaf-hopper. (*Pyrilla aberrans*, Kirby), by C. S. Misra, B.A. Price 3/-. (2) Vol. v., No. iii. Report on a collection of Termites from India, by Karin and Nils Holmgren, Högskolas Zootomiska Institut, Stockholm. Translated by T. Bainbrigge Fletcher, R.N., F.L.S., F.Z.S., F.E.S. Price 1/6. (3) Vol. v., No. iv. On a collection of Sphecoidea sent by the Agricultural Research Institute, Pusa, Bihar, by Rowland E. Turner,

F.Z.S., F.E.S. Price 1/-. These are all most useful works by practical men.—R.P.

From the Report of the Agricultural Research Institute, Pusa, Bengal, 1918, the following suggestion is extracted:—"I would suggest that an expert entomologist should settle down at Karachi until some method of reducing the awful destruction wrought by the grain pests there, has been found and put in operation. In December last (1917), I saw vast numbers of wheat bags outwardly alive with grain pests at the Karachi railway siding. W. Robertson Brown, Agricultural Officer, North-West Frontier Province."—R.P.

Parts iii. and iv. of the *Trans. Ent. Soc. London* for 1918 are to hand. There are five plates and a map, with four memoirs and nearly 150 pages of the Proceedings of the ordinary meetings. (1) "New species of *Staphylinidae* from Singapore," by Malcolm Cameron, R.N., F.E.S.; (2) "Notes on Australian Sawflies, etc.," by the Rev. F. D. Morice, M.A., F.E.S., with five plates; (3) "The Hymenoptera of Fiji," by Rowland E. Turner, F.Z.S., F.E.S.; and (4) "Notes on a large Heliconine collection made in French Guiana in 1917," by J. J. Joicey, F.E.S., and W. J. Kaye, F.E.S., with a sketch map. The Proceedings are so full of interesting and important facts and observations that ere long it will be necessary to have an index of the items dealt with, say, in each decade. The association of ants and mosquitoes, the "false head" of *Lycaenidae*, etc., the mimetic association of Ithomiine butterflies and a Diopiid moth, lice and trench fever, seasonal forms of butterflies in East Africa, races of *Pararge aegeria*, gigantism in male bees, the pairing of *Stylops* and the "assembling" of the males, bud-and-flower-like *Flatidae* (Homoptera) from E. Africa, mimetic forms of *Charaxes ethalion* and *C. etheocles*, African butterflies and their relation to the season, descriptions of ex-German East Africa from an entomological point of view, observations on the production of "cuckoo-spit," etc., are a few of these items.

The Imperial Entomologist of India, Mr. T. Bainbrigge-Fletcher, has sent the Report of the Year 1917-18, dealing with the Insect Pests which have been more or less obtrusive during that period. Naturally under the conditions then prevailing it was not possible to produce a report such as has been brought out hitherto. Yet an admirable summary of the work done has been made, and the remarks have been illustrated by a series of nearly twenty large black and white plates of imagines, larvæ, pupæ, enlargements of details, methods of attack, results, etc. Supplementary to the observations recorded previously are numerous fresh observations on the pests attacking the crops of cotton, rice, sugar-cane, indigo, mulberry and general fruits. A curious fact is that the land crabs, which damage rice so extensively, burrow to a depth of 11 and 13 feet below the surface of the ground for aestivation. "A good deal of work has been done during the year on borers and other insects occurring in *Saccharum* and other grasses." An important feature of the work done is the rearing in suitable surroundings, of various borers and root-feeders of cane and rice, to ascertain their true life-histories in detail, and to find if possible to what parasites they are subject, and test the suitability of such to effectually control the number of the species dealt with. A section of the work was to continue the experiments previously made on the Indian bee (*Apis indica*), another dealt with the "lac"

larvæ, while still another took up the subject of the silk-industry. The department has continued its admirable custom of preparing and issuing drawings (black and white), showing life-histories more or less detailed. Some 70 were thus prepared during the year. Other portions of the work, such as identification of pests, the giving of advice, the programme for the present season, and the list of recent publications, are also dealt with. The Report is a capital account of the work which is being carried on under Mr. Fletcher's skilled and experienced guidance.

At the first meeting of the year of the Entomological Society of France, M. E. Moreau took the chair as President, in place of Dr. P. Marshal, who in retiring, referred to the satisfactory condition of the Society, both from a financial as well as a numerical point of view.

In the *Bull. Soc. Ent., France*, for January, are some interesting notes by M. L. Demaison, on the genus *Chrysophanus* (*sens. lat.*). (1) The capture of a *C. dispar* v. *rutilus* of the size of *Rumicia phlaeas*, near Lusigny. (2) Notes on the very restricted distribution of *rutilus* in France. (3) The distribution of *C. hippothoë* in France. (4) The distribution of *C. virgaureae* in France, always confined to mountainous area. (5) A discussion of the occurrence of *C. thersamon* in Belgium, and (6) A giant race of *R. phlaeas* and of other Lepidoptera, near Soulac (Gironde).

In the *Entomologist* for February H. Rowland-Brown attacks the problem of the two (?) *Erebia* species, *E. ligea* and *E. euryale*—the relationship of the form *adyte*. After summarising Dr. Reverdin's article in the *Bull. Soc. lep. Gen.*, he proposes the name *borealis* for the hitherto-called *adyte*, common in Scandinavian and Arctic areas. Of this last form, the aberration in which there is no trace of the white band on the underside, he names *obsoleta*.

In the *Ent. Mō. Mag.* for March, Jas. Edwards describes two species of Cicadina (Hom.) as new to science. 1. *Macropsis decoratus*, from Bath, is nearly related to *M. nassatus*. 2. *M. populi*, from Goring, Oxfordshire, is closely allied to *M. fuscinervis*. He adds a synopsis of the British species of the genus *Macropsis*. Dr. Chapman gives detailed notes on two sawflies, *Pteronix pini* and *P. sertifer*, illustrating his remarks with three plates. The Rev. F. D. Morice announces a species of sawfly new to science in *Allantus perkinsi*, which he has separated from *A. arcuatus*, and which seems generally distributed in Devon, Surrey, Lancashire, etc. G. E. Bryant commences an account of Entomology in Sarawak, Borneo.

H. D. Hooker gives details, in the *Ent. News* for March, of the life-history of the Noctuid *Epipsilia monochromata*, the larvæ of which feed upon the leaves of *Drosera rotundifolia*, and gives a plate showing larvæ *in situ*, a pupa, and an imago.

In the March number of the *Rev. Mens.* of Namur, there is the commencement of a local list of the Lepidoptera of the neighbourhood of Namur, by M. F. Derenne, who has the assistance of the veteran worker M. J. L.-J. Lambillion. It will be very useful to many, as it will doubtless register the numerous aberrations and races observed by the enthusiasts of the virile little society of Namur. We rather wish, however, that the list had included references to the original descriptions which had been made since the appearance of M.

Lambillion's useful *Catalogue of the Lepidoptera of Belgium*, published nearly twenty years ago.

Not long ago we heard with much regret of the passing of one who was known to many of us as a quiet, unobtrusive worker, as a correspondent, or as a companion in rambles around Strood, Kent, *viz.*, J. Ovenden. From his early days he was a co-worker with our late editor in the field, and did much investigation of life-histories, and got much material for him. Especially useful were Ovenden's observations on the wintering habits of various species of "plumes," and many short notes occur in this magazine ten to fifteen years ago. To him we were personally indebted for our introduction to *Hellensia carphodactylus* in nature, and the haunts of several local *Coleophora* species were visited in his company. He was, however, of a retiring disposition, and latterly it was found impossible to get in personal touch with him. After our late editor's death the stimulus for field work went, he seemed to slip away from our purview.

The Committee of the South-Eastern Union of Scientific Societies, has been successful in obtaining a series of new and completely reliable Lantern Slides, many of an unique character, illustrative of the Life Habits, Breeding Places and Characteristics of *Anopheles*. These slides have already been exhibited several times to Scientific Societies at Lectures given under the auspices of this Committee. As neither this Committee, nor the Union, desires the monopoly of the information thus for the first time available in this best and most direct form, it has been decided to place the slides at the reasonable disposal of Scientific Societies, or lecturers (under certain conditions) by way of loan for the purpose of disseminating further and increasingly necessary information on this most important subject. If, therefore, any lecturer or any Society is interested and would like to consider the matter relative to arranging a lecture, and will communicate with the Rev. T. W. Oswald-Hicks, Hon. Sec., "Lesware," Linden Road, West Green, London, N. 15, he would be happy to do what is possible to that end.

Dr. J. McDunnough has been appointed Assistant Entomologist in the Entomological Branch, Department of Agriculture, Ottawa, to have charge of the National Collection of Insects. In returning thus to his native country he will be in a position to devote his extensive knowledge of systematic entomology to the care and building up of the National Collection of Canada.

The Curator of the Entomological Section of the Royal Museum of Natural History of Belgium, M. G. Severin, makes an appeal for further subscribers to the fund for the continuance of the publication of the *Catalogue Systematique et Descriptif des Collections Zoologiques du Baron Edm. de Selys Longchamps*, which was commenced in 1906, by a number of specialists under the care of M. Severin, and has been suspended owing to the war for nearly five years. It is desired to get others to fill the places of those who have now ceased to support this work, otherwise this monumental memoir will have to remain unfinished.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.
December 12th, 1918.—DONATIONS TO THE COLLECTIONS.—Mr.

Ashdown exhibited Neuroptera given him by the late Mr. C. A. Briggs, including *Perla maxima*, *P. cephalotes*, *Chloroperla grammatica*, *Nemoura variegata*, *Isopteryx tripunctata*, etc., and presented them to the Society's cabinets. He also showed the various species of the Coleoptera taken by him in Surrey in 1918.

EASTBOURNE TORTRICES.—Mr. R. Adkin, various species of the Tortrices bred from larvæ feeding on ivy along the parades at Eastbourne, *T. forsterana*, *T. podana*, and *T. pronubana*.

ABERRATION OF *T. BISTORTATA*.—Mr. R. Bowman, *Tephrosia bistortata* with dark suffused marginal area.

**B. PERLA*.—Mr. Barnett, a very variable series of *Bryophila perla* from Warrington.

STEREOSCOPIC SLIDES.—Mr. Dennis, stereoscopic slides of the fruiting of *Spiraea ulmaria*, and of *Heleocharis palustris*.

ABERRATION IN *D. PAPHIA*.—Mr. B. W. Adkin, *Dryas paphia* showing aberration in coloration, marking, size, and shape of wing.

A RARE COLEOPTERON.—Mr. W. West, the rare Coleopteron *Amara chara bonnairi* from Box Hill, not taken since 1863 by Dr. Power.

EXHIBIT OF *C. TROCHYLUS*, AND OF VARIETIES OF *H. CRINANENSIS*.—Mr. H. J. Turner, a long series of the Lycænid *Chilades trochylus* from Cyprus, the smallest species of Rhopalocera; also a series of *Hydroecia crinanensis* from Ireland, with several of the named forms sent him by Mr. Greer.

DWARF RACES OF *A. CORIDON*.—Mr. A. A. W. Buckstone, several series of *Agriades coridon*, and contributed a note on the dwarf local race taken on the N. Downs during the past two years.

THE SEASON.—Several members gave notes on the season. *Hibernia defoliaria* had been seen as early as September 23rd in Surrey.

OBITUARY.

Frederick Du Cane Godman, D.C.L., F.R.S., etc.

We cannot allow the passing from our midst of Frederick Du Cane Godman without any notice whatever, though there is little to be added to the many accounts of him that have already appeared in the daily press and various scientific periodicals. It was in the late "eighties" that the writer first made his acquaintance, when he went up to London to consult Osbert Salvin on the best method of mounting genitalia, for though one or two of us took up this line of investigation independently, and have perhaps become experts, yet it was Godman and Salvin who were the first to undertake this study in a really systematic way, and the writer will always be grateful to both (and particularly to Salvin) for the kindly interest and ungrudging help they gave to a young beginner.

It is unnecessary to reiterate the early details of his life, already well related in each of our contemporaries; although failing in health he retained his keen interest in natural science up to the last. He was one of the original founders of the British Ornithological Union, and it is of interest to remember that its quarterly journal, the *Ibis*, is now in its sixtieth year of publication, he was President of that Union for very many years, if not at the time of his death.

He was well known in the hunting field and was often seen with the Crawley and Horsham hounds, of which pack his brother was the Master.

The writer of the notice in the *Entomologists' Monthly Magazine* says well when he writes "Godman will need no other memorial than the *Biologia*." This is absolutely true, for that is a monument of care and work and research that will last.

One cannot, however, close this short obituary without some comment on the man himself—so modest, one might almost say retiring, yet ever ready to impart his knowledge and experience to others when they sought it, a great patron of our science and withal so gentle and the truest of friends.—G. T. B.-B.

Sydney Webb.

The announcement of the decease of Sydney Webb of Dover brings to mind associations of long ago. About the year 1872-3, as a youthful member I joined the "Holmesdale Natural History Club," which held its monthly meetings in the Public Hall, Reigate. The President and doyen of that Society was then that notable patron of nature study, the late Wilson Saunders, and associated with him in the Society were John Linnell, jun., son of the famous John Linnell, Sir Sidney Smith Saunders, a Hymenopterist of the Albanian Consular Service, Thos. Cooper, one of the early collectors of South Africa and a noted Cactus grower, Dr. Bossy, a microscopist of note, and last but not least in the group of naturalists was the late Sydney Webb. His favourite study was the Lepidoptera, of which he then had a good representative local collection, but he often exhibited fossils, plants, and insects of other orders, in fact anything of local natural history interest. It was in these surroundings that I first became acquainted with him as a kind and genial friend, one who gave freely of his knowledge and specimens to a youngster in earnest. In a Report, which lies before me, under date October 13th, 1865, Sydney Webb is included as exhibiting the eggs of the Lace-wing Fly. At that time, 1865, J. A. Brewer, the author of the "Flora of Surrey," was the Secretary. Without business occupation and with such scientific inclination and surroundings, in a district where geological formations of Chalks, Greensands, and Wealden clays, with their accompanying variety of flora and fauna, were within walking distance or at least approachable by railway north, south, east, and west, it was easy to foretell that Webb became a thorough good all-round naturalist. Even in the seventies his "Tigers" were a sight, and with the early death of his brothers, and finally his father's death, ample means were at hand for him in the last decades of the 19th century to acquire series and collections which would enrich his own, in which many historic specimens will doubtless be found. Never robust in health, for many years he had lived at Dover, doing but little field work, and his natural disinclination to appear in print has left but little from his pen. Many of the present generation knew him as a frequenter of "Stevens" rooms up till a few years ago, and to the Congresses of the South Eastern Union of Scientific Societies, when held in Dover and Folkestone, he was ready with his personal aid so far as he could. He was 83 years of age at the time of his death.—H. J. T.

Subscriptions for Vol. XXXI. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrorse," Gellatly Road, New Cross, S.E. 14 [This subscription includes all numbers published from January 15th to December 15th, 1919.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. Herbert E. Page, "Bertrorse," Gellatly Road, New Cross, S.E. 14

Subscribers are kindly requested to observe that subscriptions to *'The Entomologist's Record, &c.,'* are payable in advance. The subscription (with or without the Special Index) is Ten Shillings, and must be sent to Mr. Herbert E. Page, "Bertrorse," Gellatly Road, New Cross, S.E. 14 Cheques and Postal Orders should be made payable to H. E. PAGE.

During May and early June.—Pupæ: *Cinxia*, *Sibylla*, *Polychlorus*, *Villica*, 3/- doz.; 20/- per 100. *Z. trifolii* (Christchurch Warren), 7/- per 100. First 6 vols. of *Entomologists' Record*, well bound.—*A. Ford*, 36, Irving Road, Bournemouth.

New Cabinets and Apparatus.—Note: Finest make only, and best material only used.

12, 20, 30 and 40 drawer Cabinets in polished deal or mahogany. Specifications and prices on application.

Standard make Store Boxes, 10×8, 5/6; 13×9, 7/-; 14×10, 8/-; 16×11, 9/-; 17½×12, 10/-; postage 6d. extra. Special price by taking 12 or more of one size.

Insect and Egg Cases, Jointed Nets, Pins (Tayler's), Zinc Collecting Boxes, Setting Boards, Killing Tins, etc., etc.

Write for complete lists of set specimens, apparatus, larvæ and pupæ.

LEONARD TATCHELL, Lepidopterist, 43, Spratt Hall Road, Wanstead, E.11.

Desiderata.—*Pieris napi*—spring and summer broods with exact data (localities and dates)—from all parts of the Kingdom, especially North of England and Scotland; *Pararge ægeria* from Scotland, Ireland, and North of England—exact data needed. Will do my best in return or pay cash.—*G. T. Bethune-Baker*, 19, Clarendon Road, Edgbaston.

Duplicates.—*Varleyata* and other varieties of *Grossulariata*. *Desiderata*.—Good varieties and local forms. *Spilosoma urticæ*, *Advenaria*, and other ordinary species to renew old series. Good *Tortrices* and *Tineæ*.—*Geo. T. Porritt*, Elm Lea, Dalton, Huddersfield.

Duplicates.—*Grossulariata* var. *lutea*, *lacticolor*, *varleyata*, *fulvaticata*, etc. *Desiderata*.—Other extreme forms of *Grossulariata*, or good vars. of *Diurni*.—*Rev. G. H. Raynor*, Hazeleigh Rectory, Maldon, Essex.

Desiderata.—*Euchloë cardamines* from Ireland; also types of *E. cardamines* from Switzerland, Italy, S. France; var. *turritis* (S. Italy), var. *volgensis*, var. *thibetana*, and of *E. gruneri*, *F. euphenoides*, *E. damone*, and any palearctic species of the genus. *Duplicates*.—*Loweia doris* and vars., a few minor vars. of *R. phleas* (British), and many British lepidoptera.—*Harold B. Williams*, 82, Filey Avenue, Stoke Newington, N.

Duplicates.—*A. coridon* vars., including semi-syngrapha, *H. Comma*. *Desiderata*.—*A. coridon* var. *Albicans* (Spanish) and var. *Hispana* (do.), and good butterfly vars., especially from Ireland.—*Douglas H. Pearson*, Chilwell House, Chilwell, Notts.

Duplicates (all Clydesdale).—*Ethiops*, *Selene*, *Icarus*, *Phleas*, *Hectus*, *Mundana*, *Perla*, *Fulva*, *Nictitans*, *Tritici*, *Chi*, *Boreata*, *Cambrica*, *Belgaria*, *Immanata*, *Olivata*, *Tristata*, *Boreata*, *Mercurella*, *Angustea*, *Dubitalis*, *Ambigualis*, *Truncicolella*, *Drepitalis*, *Kuhmella*, *Fusca*, *Margaritellus*, *Hortuellus*, *Hyemana*, *Phryganella*, *Ferrugana*, *Solan-drinana*, *Sponsana*, *Conwayana*, *Stramineana*, *Rivulana*, *Urticana*, *Ocotomaculana*, *Perlepidana*, *Vaccinana*, *Geminana*, *Herbosana*, *Myllerana*. *Desiderata*.—Numerous, especially.—*A. A. Dalglish*, 7, Keir Street, Glasgow.

Duplicates.—*Janira*, *napi*, *cardamines*, *Artemis*, *P. interrogationis*, *P. festucae*, *P. bractea*, *D. conspersa*, *Haslata* (all Irish). *Desiderata*.—*Machaon*, *Artemis* (English), *Cinxia*, *Athalia*, *Cardui*, *Galatea*, *Epiphron*, *Lucina*, *Actæon*, *Sylvanus*, *Comma*. All perfect, well set on black pins.—*Charles Langham*, Tempo Manor, Co. Fermanagh, Ireland.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W. 8 p.m. 1919, June 4th; Oct. 1st; Oct. 15th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—*Meetings*: May 22nd, "Insects injurious to Forestry," B. W. Adkin, F.E.S.; May 31st, Field Meeting, Box Hill. Leaders, Messrs. H. J. Turner and W. J. Ashdown.—*Hon. Sec.*, Stanley Edwards, 15, St. German's Place, Blackheath, S.E. 3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society).—Hall 20, Salisbury House Finsbury Circus, E.C. The First and Third Tuesday in the month, at 7 p.m. Visitors invited. *Hon. Sec.*, J. Ross, 18, Queens Grove Road, Chingford, N.E.

All MS. and editorial matter should be sent and all proofs returned to **HY. J. TURNER**,
98, Drakefell Road, New Cross, London, S.E.14

We must earnestly request our correspondents **NOT** to send us communications **IDENTICAL**
with those they are sending to other magazines.

Lists of **DUPLICATES** and **DESIDERATA** should be sent direct to **Mr. H. E. Page**,
Bertrose, Gellatly Road, New Cross, S.E. 14

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.

*Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets
etc., sent on application.*

Many Rare British Species and Good Varieties for Sale.

G. A. Bentall, F.Z.S.,

~ NATURALIST. ~

Carton Store Boxes, $15\frac{1}{2}\text{in.} \times 10\frac{1}{2}\text{in.} = 2\frac{1}{2}\text{in.}$, wood sides, hinged lids, covered dark
leather paper, lined white inside, cork bottom. 3s. each. Carriage 6d. extra.

Whitewood Double Store Boxes, lined top and bottom cork Naphthaline coll.

$10\text{in.} \times 8\text{in.} \times 3\text{in.}$ — $14\text{in.} \times 10\text{in.} \times 3\text{in.}$

$17\text{in.} \times 12\text{in.} \times 3\text{in.}$

7s. 9d.

9s. 6d.

10s. 9d.

Stained and polished Mahogany colour—

10s. 9d.

12s. 6d.

14s. 9d.

Also stocked in Walnut same price as Whitewood.

Whitewood travelling setting houses. $16\text{in.} \times 12\text{in.} \times 4\frac{1}{2}\text{in.}$, hinged ends and lid
perforated Zinc both ends, 13s. 6d. each, setting boards extra.

Superior oval cork setting boards—

1in.

$1\frac{1}{2}\text{in.}$

$1\frac{3}{4}\text{in.}$

2in.

$2\frac{1}{2}\text{in.}$

3in.

$3\frac{1}{2}\text{in.}$

4in.

1s. 0d.

1s. 3d.

1s. 4d.

1s. 6d.

2s. 0d.

2s. 3d.

2s. 6d.

3s. 0d.

40 drawer New Entomological Cabinets, with Mahogany panel doors, £85 each. Full
specification of same can be supplied.

Cork Sheets—

$11\frac{1}{2}\text{in.} \times 3\frac{1}{2}\text{in.} \times \frac{1}{8}\text{in.}$

$11\frac{1}{2}\text{in.} \times 3\frac{1}{2}\text{in.} \times \frac{3}{16}\text{in.}$

$11\frac{1}{2}\text{in.} \times 3\frac{1}{2}\text{in.} \times \frac{1}{4}\text{in.}$

2s. 0d. doz. sheets.

3s. 6d. doz. sheets.

4s. 6d. doz. sheets.

$\frac{1}{2}$ doz. sheets sold; samples free.

Kirby Beard's Entomological Pins—

Size

1.

3.

5.

8.

10.

White

1s. 3d.

1s. 3d.

2s. 0d.

2s. 9d.

3s. 9d.

per oz.

Black

2s. 6d.

2s. 6d.

3s. 3d.

3s. 9d.

5s. 0d.

per oz.

$\frac{1}{2}$ ozs. of above pins supplied.

Strong glass killing jars fitted with cork, 2s. 0d. each, larger size, 2s. 6d. each.

Whitewood Breeding Cages, $16\text{in.} \times 12\text{in.} \times 12\text{in.}$, with hinged glass door and
perforated Zinc sides, 35s. 0d. each, superfine finish, also cheaper quality in deal.

Round chipette boxes, very strong—

$1\frac{1}{2}\text{in.} \times 1\frac{1}{2}\text{in.}$

$1\frac{3}{4}\text{in.} \times 1\frac{1}{4}\text{in.}$

$2\text{in.} \times 1\frac{1}{2}\text{in.}$

3d. doz.

4d. doz.

5d. doz.

Round white Metal Boxes—

$1\frac{3}{4}\text{in.} \times \frac{3}{4}\text{in.}$

$2\text{in.} \times \frac{3}{4}\text{in.}$

$2\frac{1}{2}\text{in.} \times 1\frac{1}{2}\text{in.}$

$3\text{in.} \times 2\text{in.}$

6d. doz.

7d. doz.

$\frac{1}{2}\text{d. doz.}$

$\frac{1}{2}\text{d. doz.}$

1s. 9d. doz.

Strong canvas bag for larvæ collecting, Sallows, etc. $17\text{in.} \times 30\text{in.}$, 2s. 0d. each.
Pattern of material sent post free.

Folding brass adjustable pocket net with screw, to fit any stick. 6s. 9d. each.

Tracing paper for setting insects, $20\text{in.} \times 30\text{in.}$ $\frac{3}{4}\text{d.}$ sheet, samples free.

White Tiffany (soft finish) for sleeving, etc. 30in. wide, $10\frac{3}{4}\text{d.}$ per yard, samples free.

Blue steel glass-headed pins, $1\frac{1}{2}\text{in.}$ long, for setting with tracing paper. $\frac{6}{12}\text{d.}$ box of
4 doz. pins.

Price Lists, post free, on request.

DUDLEY HOUSE, SOUTHAMPTON ST. (opposite Hotel Cecil),
STRAND, W.C. 2.

Subscriptions for 1919 (10/- post free) should be sent to H. E. Page, "Bertrose,"
Gellatly Road, S.E. 14.

Vol. XXXI.

13820

No. 6.

The Entomologist's Record AND Journal of Variation

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.

GEORGE T. BETHUNE-BAKER,

F.Z.S., F.L.S., F.E.S.

M. BURR, D.SC., F.Z.S., F.L.S., F.E.S.

(REV.) C. R. N. BURROWS, F.E.S.

T. A. CHAPMAN, M.D., F.R.S., F.E.S.

JAS. E. COLLIN, F.E.S.

H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

JOHN HARTLEY DURRANT, F.E.S.

ALFRED SICH, F.E.S.

(REV.) GEORGE WHEELER, M.A., F.E.S.,
and

HENRY J. TURNER, F.E.S.,

Editorial Secretary.

CONTENTS.

	PAGE.
Inheritance of Colour in <i>Diaphora mendica</i> , Cl., and var. <i>rustica</i> , Hb., <i>E. A. Cockayne</i> , <i>D.M., F.R.C.P., F.E.S.</i>	101
The Various Modes of Emergence and Number of Annual Broods, <i>Roger Verity, M.D.</i> ..	104
NOTES ON COLLECTING:— <i>C. polyodon</i> , <i>A. E. Tonge</i> ; <i>H. lucina</i> at Constantinople, <i>P. P. Graves (Major)</i> ; <i>Is Arctia caja</i> a day-flier, <i>C. Nicholson</i> ; <i>H. defoliaria</i> in January, <i>Id.</i> ; <i>Tortrix viridana</i> and others, <i>H.J.T.</i> ; Notes from France and Italy in 1918, <i>C. B. Ashby (Lieut.)</i>	110
CURRENT NOTES AND SHORT NOTICES	113
SOCIETIES:—The Entomological Society of London; The South London Entomological Society; The Lancashire and Cheshire Entomological Society	115

JUNE 15th, 1919.

Price ONE SHILLING (NET).

Subscription for Complete Volume, post free

(Including all DOUBLE NUMBERS, etc.)

TEN SHILLINGS.

TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,

"BERTROSE," GELLATLY ROAD, NEW CROSS, S.E. 14.

Communications have been received or have been promised from Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, C. P. Pickett, Parkinson Curtis, H. Donisthorpe, A. Sich, Dr. Verity, C. W. Colthrup, Rev. C. R. N. Burrows, Dr. T. A. Chapman, Capt. Burr, G. T. Bethune-Baker, E. B. Ashby, P. A. H. Muschamp, J. H. Durrant, Orazio Querci, Major P. P. Graves, Rev. F. D. Morice, H. W. Andrews, C. Nicholson, W. Daws, Lieut. Box, with Reports of Societies and Reviews.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/5, 2/2, 2/6, 3/2. Folding Nets, 3/9, 4/3, 4/9. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 7d., 10d., 1/2, 1/10. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 9d. per four dozen, 1 gross, 2/-. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/7 per tin. Store Boxes, with camphor cells, 2/3, 2/9, 4/-, 4/6, 5/6, 6/3. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 10/6, 12/9, 15/9. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/9, 4/6, 5/6, 8/3. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/9 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, 1/2 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/6. Glass-top and Glass-bottomed Boxes, from 1/3 per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d., 1/-; Blowpipes, 4d., 6d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families and for all insects liable to become greasy.

We stock various sizes and lengths of these Silver Pins which have certain advantages over ordinary entomological pins (whether enamelled black or silver or gilt).

NESTING BOXES of various patterns which should be fixed in gardens or shrubberies by lovers of birds before the breeding season.

SHOW ROOM FOR CABINETS

Of every description for INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS &c.

Catalogue (84 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).
Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.

Bexley]

L. W. NEWMAN

[Kent

Has for sale a superb stock of 1918 specimens in fine condition, including Varleyata; Bicuspis; Pendularia, var. Subroseata; Melanic forms Lariciata, Consortaria, Consonaria, Abietaria; Irish forms Aurinia and Napi, fine vars. Tiliae, Yellow Dominula, etc., etc. Quotations and Insects sent on approval with pleasure.

Also a huge stock of fine PUPÆ and OVA.

Write for latest price lists.

NOTICE:—Owing to huge rise in cost of metal, etc., my **Relaxing Tins** are now **3/6** small and **5/6** large, post free.

GALLS AND PIERCED BRAMBLE AND BRIER STEMS.—Mr.

L. A. BOX would be very grateful for any sorts and quantities, with localities, from all parts of the United Kingdom.

80, Northampton Road, Croydon.

Inheritance of Colour in *Diaphora mendica*, Cl., and var. *rustica*, Hb.

By E. A. COCKAYNE, D.M., F.R.C.P., F.E.S.

In 1913 I started breeding experiments with *Diaphora mendica* type and var. *rustica*, with a view to proving the presence or absence of segregation of colour in the males in subsequent generations.

Unfortunately the war prevented me from carrying them out fully, but I think the results obtained were sufficiently interesting to be worth publishing. The well-known cream coloured form of the male, var. *rustica*, appears to be the only one found in Ireland. In Great Britain the dark brown type form is almost universal, but pale coloured males have been recorded from the east coast of Scotland and I have seen one from Kent.

My original stock of var. *rustica* was obtained from Captain R. S. Gwatkin-Williams, R.N., who sent me three dozen larvæ bred from eggs laid by a female taken near Queenstown in 1911. These did well and I obtained a number of pupæ from a pairing *inter se*.

In the autumn of 1912 I received a number of pupæ from Durham, Suffolk and Somerset. The males of the first two broods were poorly spotted and not very dark, but the Somerset males were very dark brown and both sexes were heavily spotted.

The pupæ were forced and imagines began to emerge on February 21st, 1913. At first I had great difficulty in obtaining a cross pairing, but later on I experienced no difficulty and obtained seven cross pairings, four var. *rustica* ♂ × type ♀ (2 Durham, 2 Taunton) and three type ♂ × var. *rustica* ♀. I also obtained five pairings of var. *rustica*. All the ova proved fertile, and the larvæ thrived until they were nearly full grown. Disease then appeared and the majority died. At the end of the season I had 35 pupæ of Brood I. and 117 of Brood II., both var. *rustica* ♂ × type ♀ (Durham), 20 pupæ of Brood III. type ♂ (Durham) × var. *rustica* ♀, and only 17 pure bred var. *rustica*, two broods giving only one pupa apiece.

This shortage of pure var. *rustica* prevented me from obtaining pairings with the cross-bred insects in 1914. The pure bred *rustica*, in spite of the close inbreeding for three generations remained very pale cream coloured in the male sex, and showed no increase in brown colour such as has been stated to occur. A single specimen showed very pretty clouding of the outer and lower part of the forewing and of the posterior half of the hindwing with greyish-brown scales.

In 1915 emergence of the cross-bred var. *standfussi* (F.1) began on March 5th, and I obtained pairings without difficulty. I had eggs from six pairings, two ♂ var. *standfussi* (Brood II.) × ♀ var. *standfussi* (Brood II.), one ♂ var. *standfussi* (Brood III.) × ♀ var. *standfussi* (Brood III.), one ♂ var. *standfussi* (Brood II.) × ♀ var. *standfussi* (Brood I.), and one pure var. *rustica*. All the ova were fertile. To avoid risk of loss I sent a number away to friends, but all contracted disease and died. Those I kept myself did well until June, when many were nearly full grown, but eventually I obtained only ten pupæ (F.2) of Brood IV., ♂ var. *standfussi* (Brood II.) × ♀ var. *standfussi* (Brood II.).

The appearance of the males of the first generation of var. *standfussi* is stated to be intermediate in colour between the males
JUNE 15TH, 1919.

of the type and var. *rustica*. Of Brood II. (1915) F.1, I had more than 40 males. These varied from a cream colour a little deeper than any of my pure bred var. *rustica*, though paler than some *rustica* I have seen, to a creamy brown a good deal paler than that of any typical male. Of Brood III. (1915) F.1 I had six males, of which three were no darker than my var. *rustica*, and three pale creamy brown specimens.

In 1916 from Brood IV., F.2, I bred only seven imagines, five males and two females. Two of the males were quite as pale as my var. *rustica*, in fact paler than many of them. One was beautifully clouded with greyish brown scales on the fore- and hindwings, similar to the var. *rustica* bred in 1914, and one was as dark as the darkest of my var. *standfussi*, F.1, generation. Two pairings were obtained with two pale males and the two females (Broods I. and II., 1917, F.3), and their offspring had the following constitution:—

$$\begin{array}{l} \sigma \text{ (Brood IV.) } \frac{\sigma \text{ Brood II. (} \sigma \text{ var. } \textit{rustica} \times \text{ } \varphi \text{ type)}}{\varphi \text{ Brood II. (} \sigma \text{ var. } \textit{rustica} \times \text{ } \varphi \text{ type)}} \times \\ \varphi \text{ (Brood IV.) } \frac{\sigma \text{ Brood II. (} \sigma \text{ var. } \textit{rustica} \times \text{ } \varphi \text{ type)}}{\varphi \text{ Brood II. (} \sigma \text{ var. } \textit{rustica} \times \text{ } \varphi \text{ type)}} \end{array}$$

The ova were all fertile and the larvæ did well until late in their last instar, when many became diseased and died.

In the case of Brood I. (F.3) the ground colour of twenty of the males was very pale, in some actually paler than in many of my pure bred var. *rustica*. One was shaded with brown scales over the central and posterior portion of the forewing and the whole of the hindwing, especially in the interneural spaces, and the thorax was pale greyish brown. It resembled the var. *rustica* bred in 1914, and the male of Brood IV., 1916, but was darker and more handsome than either. The brood was fairly well spotted in the case of both sexes.

In the case of Brood II. also the ground colour was pale. Six males were no darker than my var. *rustica* and the rest were of various shades of pale creamy brown. The darkest was about the same colour as the middle specimen of Brood II. var. *standfussi*, F.1, arranged in order of depth of colour. All were very lightly spotted, and in this respect contrasted strongly with Brood I., in spite of their closely related ancestry.

Two males and one female had no marginal spots on the hindwings, as in several F.1 specimens of Brood II. The results show that no segregation of the dark brown colour of the type form takes place either in F.2 or F.3 generations.

Many of the specimens of F.2 and F.3 are as light as var. *rustica*, but in F.1 generation some were almost as pale as the pure race, whereas none were nearly as dark as the type form. Even with the small numbers bred I think it is safe to say that the pale colour of var. *rustica* and the dark brown of the type do not behave as Mendelian unit characters. With regard to breeding var. *standfussi*, F.1, it can be definitely stated that pairing was equally easy between either sex of var. *rustica* and the type.

Both crosses were equally fertile. In fact, fertility of the inbred stock was complete until the experiment was given up owing to the war, and the larvæ appeared to be as vigorous as pure bred larvæ. Imagines emerged for the most part in the afternoon and evening, but

sometimes in the morning and sometimes during the night. There is no very definite hour of emergence as in many species. Pairing also occurred at any time, sometimes in full daylight at midday, at other times near midnight.

Ova were laid the same day or oviposition was delayed till the third day. Notes on the development of ova and larvæ are worthless owing to the artificial conditions under which they were kept.

Disease was apparently introduced with the food. The early broods always did better than the late ones, though the tins and sleeves were sterilised with the same care and well matured nettle was always chosen.

There was no evidence that the disease, characterised by weakness, loss of appetite, and slight diarrhæa, was transmitted from one generation to the next, or that the rooms in which the larvæ were kept remained infected from one year to the next.

The only previous experiments on crossing the two races, on which I have read accounts, are those of Caradja and Standfuss. Caradja first crossed ♂ *rustica* × ♀ *mendica*, but all the larvæ except two died of pebrine. Next year he did much better, and found this cross perfectly fertile, though the mortality from disease was very heavy.

He found the reciprocal cross much weaker and only obtained 15% of larvæ from it. This was confirmed in later experiments. His *rustica* were from the Caucasus, and this may account for this difference in his results and mine. I found no difference in fertility in the two crosses. Caradja and Standfuss found that the F.1 generation of ♂ *rustica* × ♀ *mendica* were intermediate, but nearer to *rustica* than to *mendica*.

The reciprocal cross they found produced darker specimens, whereas the six males which I obtained were even nearer *rustica* than those bred from *rustica* ♂ × *mendica* ♀.

Probably with larger numbers the result of both crosses would be found to be similar. Caradja has named four of the forms he obtained. The very pale forms almost like *rustica* he calls var. *clara*, of which he obtained 23%, the pale intermediate he calls var. *standfussi*, of which he obtained 24%, and the dark intermediate forms var. *mus*, of which he obtained 33%.

In my series these three forms merge into one another so evenly that I can see no advantage in giving them separate names, and Standfuss calls them all *standfussi*. Caradja himself had about 20%, which he could not definitely place under his varietal names.

His fourth form, of which he bred three males, he calls ab. *mixta*. It had a ground colour like var. *clara*, with a central cloud over the forewings. This appears to be almost identical with the form of which I bred two specimens, one in 1916 and one in 1917. It is a very distinct and beautiful aberration. Caradja crossed his var. *standfussi* with both ♂ and ♀ *rustica* and *mendica*, but does not describe their progeny. He also inbred his *standfussi*, but only obtained a few weak larvæ, so that his experiments throw no light on the question of whether segregation occurred in the F.2 generation or not.

The results obtained by Caradja and Standfuss show that the colouring of var. *rustica* appears more strongly in the F.1 generation in the males than that of *mendica*. This result is confirmed by me, and I found further that it extended to the F.2 and F.3 generations. The

inference drawn by Standfuss from this is that *rustica* is a more ancestral form than *mendica*. *Rustica* is found in the eastern and western outskirts of the range of the insect, and in the east appears to occupy a higher altitude than typical *mendica*.

It is found in Ireland, Hungary, Roumania, the Caucasus, Cilicia, and Armenia. This may be explained by the newer form with a dark brown male having arisen somewhere in the centre and spread in all directions towards the periphery.

Caradja.—*Societas Entomologica*. Zürich.

1894-1895. ix., No. 7, p. 49.

1895-1896. x., No. 7, p. 49.

Standfuss.—*Handbuch. Paläarkt. Gr. Schmetter.*

f. Forscher u. Sammler, 1896. p. 223.

(9 Figures.)

The various modes of Emergence and the Number of Annual Broods of the Grypocera and of the Rhopalocera of Southern Europe, illustrated by the Tuscan species.

By DR. ROGER VERITY.

(Continued from p. 72.)

Polyommatus icarus and *Agriades thersites* behave in much the same way as *C. pamphilus*, having also two graduated broods, and sometimes, between these, two apparent broods. The first brood emerges in Florence from the 10th of April, is very abundant at the end of May and in the first half of June ("nucleus" of that brood) and then diminishes till the end of July; it is distinguished by the decided grey colour of the underside of the wings, and by the greenish metallic scales of the base of the hind wings; the females are besides adorned by blue scales more or less abundant on the upper side. This characteristic however diminishes in June, when numerous individuals appear that do not show it, therefore it would seem attributable to secondary characteristics acquired by the individual from external conditions during the development of the wings in the chrysalis; in fact there appear also in the second brood some rare individuals who present it. The second brood emerges from the first days of July to the middle of September; it is distinguished in a special manner by the usual tawny colour of the underside, which is seen in summer in so many species, especially on the hindwings, and by the absence of the greenish metallic scales at the base. In Florence, according to Querci, this brood remains more or less constant in numbers during August and till the 15th of September. At Forte dei Marmi it becomes much more abundant at the end of August and at the beginning of September ("nucleus" of the second brood), but I am ignorant of what happens later. In Elba the first brood ceases to emerge at the end of May, and the second at the end of August; the species is scarce in that locality, compared with Florence, and the broods are shorter. With regard to this it is instructive to note the erroneous interpretations of data which one may commit for want of general knowledge of the different types of emergence. In vol. xlviii of *Bull. Soc. Ent. Ital.*, p. 193, I gave the following indications on the *icarus* of Elba (Poggio): "first brood, ♂ till 29th

of May, ♀ till 25th of May; second brood, ♂ and ♀ 28th of June to 20th of July; third brood, ♂ and ♀ 6th of August to 30th of August." It is now evident that in Elba the tardy families of June and July are wanting; therefore there is an interval between the two broods, but the emergence from 28th of June to 20th of July constitutes the "precocious" group of the second brood, separated from the "tardy" group (from the 6th to the 30th of August) by the summer pause; this apparent brood had led me wrong; therefore there are only two broods, not three. Tutt, in vol. iv., revised also by Wheeler, of his *British Butterflies* (1914) concludes on p. 215, with the greatest confidence, that *icarus* at Malta has four, and most probably five, and perhaps even six broods, deducing it from the following observations: "8th of March, one ♂; a few ♂ ♂ worn the 26th; ♂ ♂ common, quite fresh, only one ♀ seen the 6th of April; a few worn the 14th April; the 17th of April one worn ♂ only; on 18th of May common and quite fresh; and on the 15th and 17th common and fresh; abundant and fresh the 24th of May and the 2nd of June, with some ♂ ♂ of the *celina* variety, and all ♀ ♀ dark; the 7th of June common but worn; the 14th of June abundant and fresh, *celina* and ♀ ♀ of the *rufina* variety; on the 18th of August ♂ ♂ of *celina* fairly common, but no ♀ ♀ seen; on the 2nd of October the species still in existence."

A comparison with Florence reveals instead a surprising resemblance of emergence in localities so different in latitude, confirmed by Querci's material from Sicily, where the second brood begins towards June 10th, and shows clearly that also at Malta groups of individuals fly successively much too near each other to constitute broods; from the 8th of March to the 13th of May only sporadic precocious individuals appear; from the 13th of May to the 2nd of June is the "nucleus" of first brood; about the 14th of June commences second brood with characteristic aspect, and its nucleus probably comes on just after August 18th. The observer does not tell us if the examples from the 2nd of October were old or fresh, but, in any case, they would probably in this last case be the autumnal "precocious" individuals of the spring brood (apparent brood), therefore the six broods of Tutt are reduced to two!

It will be observed that the nuclei of the two broods of *icarus* and of *thersites* coincide with the appearance of the two of *Agriades thetis*; that of the second at Forte dei Marmi coincides with the third of *Aricia medon*.*

To complete these remarks on graduated emergence I must recall the phenomenon already noted (*Bull. S. E. It.*, xlv., p. 113) concerning the first brood of *Melitaea didyma*, Esp., which consists of a subdivision into two groups, separated by twenty days interval (another

* I must also mention a phenomenon which I have observed last year (1918) at the Forte dei Marmi, on the Tuscan coast; in the second half of July males of *A. thetis* and of *Polyommatus icarus* emerged in great numbers, but not one single female was observed amongst them; in the second half of August the normal emergence of the females took place, and a good number of males emerged with them, although they were distinctly less abundant than in years in which the July emergence had not occurred, contrasting sharply with the few battered survivors of the July lot. If females had existed in July one might have been tempted to consider the possible existence of three broods. This phenomenon might be called "mono-sexual emergence."—R.V.

case of bipartite brood, but not due to the summer pause); the second group began by the appearance of numerous males, and after five days the females re-appeared, as if it were a new brood; numerous larvae were found whilst the first group was flying; all this seemed to me at that time unexplainable, but the knowledge of the type of graduated emergence now explains sufficiently its origin, and it does not seem necessary to recur to the hypothesis that possibly the second group was generated by the second brood of August and September, in which the individuals are much less numerous than those of the first, whilst the first group would consist of families with only one brood, whose larvae would consequently have hibernated at a more advanced stage of development than the others.

I will conclude this account of the various types of emergence of the *Rhopalocera* and *Grypocera* by mentioning the special phenomenon observed by Querci at Formia (Caserta), concerning *Gegenes lefebvrei*, Ramb., and described by him in vol. v. of the *Études de Lépidopt. Comparée*, of C. Oberthür, p. 191. This species appears in the imago stage in four different periods of the year: in May and June, in July, in August, from September to November; each appearance happens in a different locality from that of the others; therefore there is only one brood in each; these localities are only half a kilometre to one kilometre distant from each other, but, notwithstanding, attentive observation has shown that during the presence of the butterflies in one of them, not a single individual appears in any of the others; it seems to me that one may conclude that the *G. lefebvrei* has only one brood, and that the two broods mentioned by several writers do not exist, and are to be accounted for by the above-mentioned phenomenon. In Tuscany, Elba excepted, where it flies in July, and where I do not know if it is to be found at other seasons, there exists only one brood in the last days of August and in September. I would propose to call this phenomenon: "*migrating emergence*." We can partly explain it by observing that *Augiades sylvanus* also has practically one brood of the duration of about two months, and that it emerges at very variable seasons of the year, according to localities, and also according to the years; thus, in the Pian di Mugnone (an arid locality near Florence) it emerges from May to July, at the Forte dei Marmi (Lucca), in a marshy situation, it emerges from July to the end of August, that is to say, at the seasons when Lepidoptera are respectively more abundant.

Having completed the study of the principal types of emergence with regard to the number of broods, and to the seasons of the year in which they occur, we can now pass to a rapid examination of other variations. One of these consists in the notable difference between the number of individuals of one brood and those of another, or of the other two, in regard to which, generally, there is a distinct *primary* brood, and sometimes there even exists a *primary*, a *secondary*, and a *tertiary*. This phenomenon is connected in an intimate manner with the principal types of emergence described above, because it is sometimes so constant in one species that it must be counted amongst its "specific" characteristics. In *Colias croceus*,* the number of individuals of the third brood is always so superior to those of the individuals of the other two, that it is not possible to admit a direct descent of the

* = *Colias edusa*.—H.J.T.

third from the first and second. We are obliged, on the contrary, to conclude that the greater number of families, or of individuals, are reproduced once a year only, as happens to the entire species in less southern countries, and that even with us it is only the minority which profits by the more favourable climatic conditions to reproduce itself two or three times. We are concerned, therefore, with a species which belongs only partially to the type of emergence with three broods; examples so conspicuous and so constant in all regions are not numerous, but there exist also with us, some others which constitute a transition from one type to the other.

Thus, *Nisoniades tages*, *Augiades sylvanus*, and *Scolitantides baton* are of the "bigenerate" type, but the second generation is so limited, both in the amount of individuals and in duration, that those species can practically be considered of the "annual" type; the first generation instead is extremely long, and in the case of *baton* individuals of the two broods emerge together in August, those of the second being distinguished by their very small size. We then also have the genus *Cupido*, and especially *sebrus*, which belong to the "bigenerate," but their second brood is so small and variable, that they ought almost to be grouped with the "annual" species; the reduced broods are called "partial." We have also a third graduation in some species which undoubtedly belong to this last group, but which in special geographical and annual conditions, produce a second brood; for example, there has been several times noted an emergence of *Euchloë cramerii*, Btl., at the beginning of September,* which constitutes, perhaps, a second brood (it seems, however, more probable that it is only a case of the emergence of tardy individuals of the first, that is, of an apparent brood; this hypothesis is confirmed by the fact that the nymphosis of *cramerii* can also be "biennial"); Querci has collected at Formia (Caserta) during an exceptionally mild and dry October, a series of very small *Augiades sylvanus*, which Turati has named *sylvanellus*, whereas, generally, there exists also in that locality one brood only from May to July, or possibly a second partial one in September. At the end of August, 1917, I collected a small number of individuals of the two sexes of *Melitaea athalia*, Rott., at Forte dei Marmi, where the species is abundant in June. In this category there would also be the real autumnal broods of some species, of which we must, perhaps, admit the exceptional appearance in favourable years, and which must not be confused with the much more frequent apparent broods (see p. 69). These appearances at unusual periods might be called *extraordinary* broods, in contrast with the *ordinary* broods.

Returning to the consideration of the ordinary broods, according to their importance, there does not seem to be any connection between the number of individuals and the degree of robustness of their structure; thus, *Melitaea phoebe*, Kn., is an eminently summer species, whose first brood is very secondary compared with the other in all regions, and, notwithstanding, it is composed of individuals much larger and more brilliantly coloured, precisely as in *M. didyma*, where the first brood is, on the contrary, very far the primary.

* Stefanelli captured a couple at Fiesole, in 1886; I possess a male collected at Signa. I have myself collected four individuals, on September 4th, 1913, at the Badia a Coltibuono, in Chianti. The two forms of the species have representatives among them.—R.V.

There seems, instead, to be a certain connection between the relative specific importance of the different broods, and their disappearance in the localities where their number diminishes; *Gonapteryx rhamni*, L., emerges, for example, at the end and flies at the beginning of the season in regions where it has a single brood, and, in those where it has three, the hibernating one is the primary; *Colias croceus*, F., and *Pontia daplidice*, L., fly at the end of the season in the first case, and the third brood is the primary in the second case.

The numerical proportion between the individuals of the various broods is not, however, constant (specific) in the majority of cases; it is rather determined by the environment (climate, vegetation, parasites, etc.), and these are distinctly "local proportions." In some localities, these external causes can actually suppress the development of a brood, which, in localities not far distant from the same regions, are very rich in individuals ("suppressed broods"); the Pian di Mugnone offers a good example in the total, or almost total, disappearance of the third brood of various species (*podalirius*, *napi*, *sinapis*, *rhamni*, *cleopatra*, *lathonia*, *aegeria*), or of the second of other bigenerates (*minimus*, *semiargus*, *alcetas*, *cardui*), whilst the first mentioned generally afford a great number of individuals in Tuscany; the cause of this phenomenon is, perhaps, the summer drought in the Pian di Mugnone, where springs of water are wanting.

Another phenomenon rather nearly related to the above mentioned consists in the "annual variations" presented by the frequency of the various species in the same locality; they are so great as to seem incredible and inexplicable in the species with one brood; these, in fact, disappear almost entirely in certain years, and are most abundant in others; in the Pian di Mugnone, for example, there were found only six ♂♂ and one ♀ of *Agriades escheri* in 1915, notwithstanding assiduous search during all the season of its appearance; in 1917, there were collected 50 males and 31 females; in that year, it was most abundant on the Monte Fanna, which overlooks the said Piano; on the other hand, in the park of the Royal Villa of Petraia, where it is often abundant, only half-a-dozen individuals were found; in the Pian di Mugnone, in 1915, during all the good season, there was found only one *Brenthis dia* in June; on the other hand, in 1917, there appeared a few examples in April and a few in June, while no less than 35 were collected in August and September. Only a few isolated specimens of *Zygæna* appeared on the wing near Florence in 1918, whereas several species were quite abundant in previous years! Also the *Grypocera* and *Rhopalocera* were all much scarcer last year.

These remarkable annual fluctuations are difficult to explain, because one must either admit an accentuated tendency in the ♀♀ to move from one locality to another for egg depositing, which does not correspond with observed facts in many species, whose ♀♀ are, on the contrary, very sedentary, and never move from a very restricted zone, or a frequency of nymphosis lasting two or more years, which is not confirmed by breeding;* perhaps parasitism and other pathological causes offer more admissible explanation, although still very obscure and insufficient.

* The biennial nymphosis has been proved in a small number of individuals of *Euchloë crameri*; the emergence, after several years, of some *Saturniæ* is well-known; *Erbia ligea* and *Eneis ællo* emerge constantly in alternate years (*generatio bima.*)—R. V. [This is not the case in Switzerland.—G. W.]

The existence of *specific* and *geographical variations* in the number of the individuals of various species is so well-known that it suffices to mention it briefly. For the most part it is a case of true and proper geographical variations, which has nothing to do with particular specific tendencies, and there always exist localities where even the species which are generally more abundant can be *sporadic*, more or less (at the Baths of Valdieri, in the Maritime Alps, *Pararge megera*, L., has been found once only during various years of assiduous collecting by Turati and myself), and where the species most diffused everywhere are wanting (*Coenonympha pamphilus* at Valdieri itself), or, on the contrary, there are localities where a generally rare species is abundant (in the valley of the Fegana (Lucca) the ♂♂ of *Loweia dorilis*, Hufn., were found in abundance in 1915, together with a few ♀♀), but there seems to be also a constant tendency in single species to multiply in great numbers or to remain scarce in whatever locality and in whatever environment, which cannot be explained except as a true and proper specific characteristic; we cannot explain how, in some instances, they can continue to reproduce and to maintain themselves so diffused in every kind of locality with a very small annual number of individuals; *Loweia dorilis* is an example of this, and it is to be noted that also in the Fegana Valley the ♀♀ were very few; another case is that of *Aricia medon*: though much more abundant than *L. dorilis* and also more diffused than the latter, there never develop in any region of Europe a number of individuals to be compared to those of other *Plebeidi* (*argus*, *icarus*, *thetis*, etc.). Among the specific characteristics one can therefore note "scarcity" or "relative abundance" of individuals.

Another characteristic is presented by the "localisation" or the "diffusion" of the various species, and in this case also one must perhaps distinguish between "geographical" localisation determined by environment, amongst which in the first place comes the distribution of vegetation, and then purely "specific" localisation, which some species present constantly everywhere, even without apparent reason. Amongst these last we may note the distinct tendency of the ♂♂ of *Anthocharis cardamines* to fly, often in great numbers, in determinate restricted zones (small portions of brooks, paths, etc.), from which they do not wander; in general the ♀♀ of Lepidoptera are much more localised than the ♂♂, and they wander less from the place where they emerged and where they deposit their eggs; therefore the ♂ may be scattered abundantly in a region and the observer may never see a ♀, if he doesn't discover the "centre" of production of the species; but in the case of *cardamines* precisely the opposite happens, because the ♀ is much more scattered and wandering, and is not more frequent in the zones where the ♂ is found; this and other similar examples denote a real tendency in certain species to unite in restricted areas and remain there; perhaps the sociability shown by many species is not extraneous to this, as one always finds two or three individuals flying together when there are no others in the neighbourhood.

Finally, there are in the various modes of emergence of Lepidoptera differences inherent in the sex; as a general rule, there emerge first a certain number of ♂♂, and the ♀♀ begin to emerge some days after, and continue to emerge later than the other sex; the *Satyridae*

especially offer examples of ♀ ♀ which are still emerging, when all the ♂ ♂ are already old; in *Epinephela jurtina*, and in *Pyronia tithonus*, the difference of time from the beginning of the ♂ ♂ to that of the ♀ ♀ reaches twenty days, and as long a time elapses between the emergence of the last ♂ ♂ and that of the last ♀ ♀; in very few species the two sexes emerge always contemporaneously, as *Agriades escheri*, and in one only (*Gegenes lefebrei*) has the mass of the females been observed to emerge before that of the males in some localities. Frequently the singular fact is seen in many species of some precocious sporadic examples of the female sex emerging at the beginning of the brood of ♂ ♂, or even before these last, and then on more ♀ ♀ appear until they begin to emerge in mass.

Other general rules well-known are that the ♂ ♂ are in numerical proportion superior to the ♀ ♀, and sometimes in enormously greater numbers, as happens in many *Lycaeninae* (*L. orbitulus*, *H. dolus*), and in many *Grypocera* (*E. laratherae*, *H. carthami*, *H. armoricanus*, etc.); it is true that the ♀ ♀, being often less active and more sedentary, are much less visible, but, notwithstanding this cause of error in estimating them, the true disproportion in the emergence of the two sexes is always very notable, and the proportion in the different species is sufficiently constant to form a good differential characteristic; in two species of *Agriades*, related and so similar to each other, as to have been confused together until last year, *coridon*, Poda, and *aragonensis*, Vrt., Querci has observed that in all localities, both in those where they fly together, as well as in those where only one species flies, the first presents a proportion of 10:1* and the second of 1:1 between ♂ ♂ and ♀ ♀; in very few species again the proportion is reversed, there being more ♀ ♀ than ♂ ♂ (*Melanargia arge*, *Satyrus neomyris*); it is to be noted that the increase in the relative number of the ♀ ♀ is often proportioned to the localisation and to the scarcity of the species, and one might suppose that this was on the way to extinction; instead, an excess of ♂ ♂ would constitute a waste in the economy of of the species, which would seem to denote a high degree of vitality and of generative power; on the other hand it is to be noted that in the case of *aragonensis* and of *neomyris* the individuals of the two sexes are very abundant in the localities where they are found, therefore the ability to multiply is certainly not deficient, and the increase in the number of the ♀ ♀ does not seem to be accompanied by less prolific power in this sex.

(To be continued.)

NOTES ON COLLECTING, Etc.

C. POLYODON.—Quite by chance I found a nice male of *Cloantha polyodon* (*perspicularis*) at rest on a garden paling in Worthing. This may be worth recording, as South only mentions five British records for the species.—A. E. TONGE, Aincroft, Reigate. May 15th, 1919.

[The references to the five previous records are as follow:—1841, *Ent.* I., 128, Yarmouth; 1855, *Ent. Ann.* I., 47, Ashford; 1892, *Ent. Rec.*, III., 159, Folkestone; 1894, *Ent.*, XXVII., 170, Clonbrook; 1894, *Ent. Mo. Mag.*, XXX., 88, Norwich.—H.J.T.]

* This however is not everywhere the case. At Royston, for example, the ♀ ♀ vastly outnumber the ♂ ♂, and I observed the same thing, in a somewhat less marked degree, in 1918, at Prince's Risborough, in the Chilterns.—G.W.

HAMEARIS LUCINA AT CONSTANTINOPLE.—On April 20th I found *H. lucina* occurring very locally in a locality in the Belgrad Forest district near Constantinople, which I had visited later in the spring before the war without taking this insect, which perhaps reaches its South Eastern limit here. Of the four ♂s and five ♀s taken several seem distinctly larger than the average of British specimens. This is a new addition to the Constantinople list.—P. P. GRAVES (Major), G.H.Q., Constantinople. May 12th, 1919.

IS ARCTIA CAJA HABITUALLY A DAY-FLIER?—I ask because I have never met with it in diurnal flight, and do not recollect ever seeing such flight recorded, although of course *A. villica*, *Callimorpha dominula*, and other allied species are well-known day-fliers. I have been told that it has been taken flying in sunshine, and its brilliant colouring would suggest warning colouration as a day-flier. C. NICHOLSON, Chingford. March 24th.

HIBERNIA DEFOLIARIA IN JANUARY AND FEBRUARY.—Has Mr. James met with this species in Ongar Park Wood so late as these months? It has been taken sometimes as late as these months in Epping Forest.—ID.

TORTRIX VIRIDANA AND OTHERS.—The oaks are again this year being badly devastated by the "green Tortrix" and other larvæ in most of our Surrey woods. A ramble under the trees at the west end of Wimbledon Common, on May 24th, covered one with a crawling mass. At Box Hill on May 31st the devastation was almost as bad. In some places practically every leaf of the undergrowth was curled by the pupating larvæ which had come down from the oak branches above.—H.J.T.

NOTES ON ENTOMOLOGY IN FRANCE AND ITALY IN 1918.—Whilst walking on Vimy Ridge in the middle of December, 1917, I found four larvæ of *Phragmatobia fuliginosa* feeding in the inside of an old German haversack. These I brought back with me to Boulogne, where three of them soon pupated, and I obtained the first moth on January 24th, 1918.

March 9th.—To-day has been a beautiful, almost spring day, and when looking for the early spring flowers in the Vallée de Denacre, a few kilometres from the Porte Calais in the old town of Boulogne, I saw a hibernated specimen of *Eugonia polychloros* flying and occasionally settling on the trunks of trees. Its colour seemed perfect, but the hindwings were a little ragged, too much so for the cabinet.

March 13th.—To-day I have seen hibernated specimens of *Aglais urticae* between Boulogne and the Bois du Souverain Moulin, mostly in very fair condition.

March 20th.—Whilst walking in the Forêt de Boulogne, beyond La Capelle, I saw two more hibernated specimens of *E. polychloros*. As I have since last July observed odd specimens of this butterfly in the Forêt d'Hardelot, in the Vallée de Denacre, and to-day in the Forêt de Boulogne, it would seem that this species is quite well established in the district; the above places are some miles apart.

April 3rd.—The "fortunes of war" have sent me to Italy, and

to-day, whilst travelling between Turin and Alessandria I noticed a number of "whites" flying in the fields alongside the railway, and amongst them were apparently specimens of *Gonepteryx rhamni* or *Colias hyale*, but I was unable to ascertain which.

April 4th.—Arquata. Arriving yesterday, I took the first opportunity for a walk shortly after lunch to-day, and was pleased again to meet with specimens of *E. polychloros* flying along the slopes above the banks of the small river Scrivia. I also noticed specimens of *Xylcopa*, the large bee, busily engaged at the spring blossoms which are everywhere abundant even in this mountainous district. There was, however, no sun to-day, still I have great hopes of this place from an entomological point of view if I remain here.

April 5th.—Again to-day no sun and therefore nothing Lepidopterous on the move. However, I could not but observe the large number of many kinds of alpine and other plants already in bloom everywhere in the gorges and fields on either side of the river Scrivia, a sight which would appeal to any of our botanical friends, and to me a goodly portent of the entomological life that will no doubt shortly be apparent. Two moths came in to the electric light last evening, and again I saw the *Xylcopa* bee at work. Another bee was also seen, having a light brown body and striped with black.

April 6th.—At last a gloriously fine day. This afternoon I crossed the river by the old wooden bridge, and collected along the right bank towards Arquata. *E. polychloros* was in considerable number, sunning themselves on the drying mud below the willows fringing the river. I also saw three *Euanessa antiopa* flying along the various streams which empty into the Scrivia. *Leptosia sinapis* was out in perfect condition in some number, hibernated *Gonepteryx rhamni* were everywhere, and fresh *Pieris napi* were not uncommon. I also added a male of each of *Callophrys rubi* and of *Celastrina argiolus*, apparently just emerged. A fine specimen of the *Xylcopa* bee was my last capture for the walk.

April 11th.—After several days of incessant rain I ventured out this afternoon, when the sun appeared for a short time, and heard the cuckoo for the first time this season. Near the bank of the river I met with three examples of a curious black Orthopteron I had not previously seen; it appeared to be able both to run like a beetle, and to have the power of leaping as a grasshopper does.

April 15th.—At last the sun triumphed, and at about 11.30 I went for an hour on the hill-side overlooking the river. *Pieris napi* was now out in abundance, a specimen of *Celastrina argiolus* was noted, and two examples were seen of what at the time I took to be *Thestor ballus*. Later in the day, in the garden of the Villa Pisano, where I am staying, the *Xylcopa* bee was busy, and I saw a specimen of a freshly emerged *Papilio podalirius*, together with hibernated specimens of *Gonepteryx rhamni*, *Euanessa antiopa*, and *Eugonia polychloros*. A fresh specimen of *Pararge aegeria* var. *egerides* put in an appearance. An evening ramble on the right bank of the river, past the entrance to the gorges, produced another *Polygonia c-album* in good condition and a fresh *Leptosia sinapis*, but I failed to capture what I am almost certain was *Anthocharis crameri* (*belia*).

April 16th.—To-day I climbed the steep hillside behind the Villa and took *L. sinapis* female, *A. crameri* male, and saw a *Papilio machaon*.

In the garden, in the evening, I noted *L. sinapis*, *P. napi*, *P. aegeria* var. *egerides*, and a solitary male of *Pieris brassicae*, but as yet *P. rapae* has been absent.

April 19th.—Three days of rain have stopped all collecting, but today, during the furtive gleams of sunshine, numerous specimens of *P. rapae* were in evidence in the garden. Besides the *Xylocopa* bee, which is becoming more and more noticeable, there are numerous other Hymenoptera more or less common. A large "Bumble-bee" with two yellow bands across the abdomen, a good sized bee of a tawny-red colour, and another, a grey-brown species with very distinct tufts on its legs, are perhaps the most obtrusive. Odd specimens of *C. argiolus* are met with practically every day, but so far no abundance.

April 20th.—There was strong sun light to-day with high wind, and I collected for a short time in a narrow valley with a small stream, running due west behind the hotel Arquata Scrivia. This should prove a good collecting ground as the valley is well sheltered on both sides by high ground. I took *Papilio podalirius* and male *Colias hyale* quite fresh, also female *Pieris napi*. The females of this species here seem generally to have only one black spot on the fore-wings. *Leptosia sinapis* and *Pararge aegeria* var. *egerides* were taken, and a pair of *Nisoniades tages* apparently just emerged. A specimen of *Melitaea didyma* was also noted.

The next afternoon I again visited this valley, picking up *Euchloë cardamines*, *Callophrys rubi*, and *N. tages*, with a female of *L. sinapis*. One specimen of hibernated *Aglais urticae* was seen, a species which apparently is not very common here. *P. aegeria* v. *egerides* was again seen, while *P. napi* was in abundance. The spring butterflies mostly were still scarce. Probably the very cold nights and the wet and sunless days hindered their due appearance.—(C. B. ASHBY, F.E.S.)

(To be continued.)

CURRENT NOTES AND SHORT NOTICES.

NORTH WALES.—*Ent. Record*.—II., 63. March: xii., 269. June: xiii., 369. Sept.: xvii., 259. Jy.:

Ent. Mo. Mag.—X., 179. (summer): xiii., 211. Oct. (sugar):

Ent.—VI., 405. March: x., 256. Jy.: xxi., 318. Aug.: xxii., 294; xxiii., 361. Jy.: xxiv., 16. June: xxv., 315. Jy.: xxvi., 196. (spring): xxix., 289. May-June: xxx., 67. Aug.: xxxi., 20; xxxii., 95; xli., 64, 91.

NORFOLK.—*Ent. Record*.—II., 225. July (Broads): v. 252. July (Cromer): vii., 306. Summer: xi., 259. Aug.: xii., 271. June: xii., 301. Aug.: xvi., 24; xvi., 50. June: xvii., 255; xix., 291. Sept.: xxi., 56; xxiv., 230.

Ent.—VI., 52; ix., 19 (Norwich): x., 15. Jy.-Aug.: xi., 96. Feb.: xv., 134 (sugar): xvi., 9; xvi., 19; xvi., 271. Aug.: xvii., 33; xxiii., 355; xxiv., 304 (gas-lamps): xxxii., 279. Aug.-Sept.: xxiv., 26. Jy.-Aug.: xlvii., 246. Jy. (Crambi).

Ent. Mo. Mag.—V., 104; viii., 271. Aug.: xiii., 246 (light); xviii., 239; xxvi., 301 (Hunstanton); xxxiv., 115.

KING'S LYNN.—*Ent. Record*.—II., 40, 289. spring: vii., 161; xiii., 303; summer: xvi., 103, 295.

Ent. Mo. Mag.—XIX., 165; xxiv., 243; xxv., 306. Summer: xxix., 45. Light: xxx., 50.

In the *Revue Mens.* of Namur, for February, Ch. Cabeau announces and describes three new aberrations of *Apatura iris*. (1) *ab. transtenuata*, in which the white markings on both fore- and hindwings above are smaller and thus more separate, and similarly on the underside the white markings are much reduced and the band divided. The rays are more or less marked by reddish-brown. (2) *ab. monophana*, in which the white spots below on the hindwing are almost obliterated by dark suffusion, and with still further contraction and suffusion of the white marks on the forewing than in the *transtenuata* form. (3) *Ab. penumbrata*, in which there are only a few small spots, dots, and traces of the white markings remaining.

A note from Signor Querci informs us that his "wife and daughter have left Florence and are now in the Peninsula of Sorrento (Naples) to collect Lepidoptera," and that he "hopes to be able to offer very nice species from South Italy next autumn."

The *Irish Naturalist* for March contains a report of Irish *Ichneumonidae* and *Braconidae* for the year 1918, by the Rev. W. F. Johnson.

In the *Scottish Naturalist* for March, Percy H. Grimshaw has begun an article on the "Collection and Preservation of Diptera," summarizing our knowledge of the habits of the various families with a view to the discovery and capture of the species, and contributing a series of useful, practical hints as to preservation of one's captures. In the same number the following butterflies are mentioned as having been met with on the Island of Coll in the Inner Hebrides. *Argynis aglaia*, *A. selene*, *Aglais urticae*, *Pyrameis atalanta*, *P. cardui*, *Epinephele jurtina*, *Coenonympha pamphilus*, *C. tiphon*, *Hipparchia semele*, *Callophrys rubi*, *Polyommatus icarus*, and *Pieris napi*.

In the *Naturalist* for March, W. Mansbridge gives a list of the Micro-Lepidoptera met with by him in the famous Wharfedale of Yorkshire, and incidentally remarks that he has found no tendency to melanism in the locality except in the case of the Macro *Polia chi*.

The *Entomologist* for March contains Collecting at Rannoch in 1918 by F. G. Whittle, a Summary of the British Neuroptera noted in 1917-18 by W. J. Lucas, a List of Hymenoptera and Diptera of a Kentish Salt Marsh (Faversham), by Major Robertson, and Lepidoptera from South Norway, near Christiansund, by J. C. Hawkshaw. In the April number there is an interesting article on Some North Country Species and Forms of Lepidoptera by J. J. Lister, F.R.S.

In the *Ent. Mo. Mag.* for April is an article entitled "Twenty-five Years in South Devon," dealing with the various rare and local species which have been obtainable there almost exclusively for many years past.

The *Ent. News* for April has an extremely interesting article on a Micro-Lepidoptera, *Euclemensia bassettella*, which is parasitic on a Coccid *Kermes galliformis*, which infests the oak in some parts of N. America. It was at one time erroneously said to be a gall-feeder. The authors of the paper, Messrs. A. H. Hollinger and H. B. Parks, claim that the species is widely distributed and that in a few cases it has been sufficiently abundant to materially reduce the Coccids' numbers. There is also a plate of figures in illustration of the paper.

That genus of wonderful "house-builders," *Coleophora*, is still being added to. In the April number of the *Ent. News* is the first instalment of an article dealing with new species and remarks on several previously

known, but whose life-histories had not been discovered. We trust that previous literature will be referred to as the first new species described (p. 109), is named *C. apicella*, n. sp. A *C. apicella*, was described in Stainton's *Annal* 1858, p. 93, under that name, and the species is given in all our British works and listed in Staudinger's Cat. III., ed. (2), p. 198. Two of Clemen's species are re-described with their life-histories added, viz., *C. viburniella* and *C. cretaticostella*.

To those interested in the Other Orders containing the more minute and more obscure insects, we would recommend the opening article of the *Can. Ent.* by Chas. Macnamara, on "Colembola," the Spring-tails. It is illustrated by two plates, one of each of the sub-orders, the Arthropleona ("Jointed-abdomens")—the Symphypleona ("Together-grown-abdomens").

We have received a copy of the *Vasculum*, the Illustrated Quarterly dealing primarily with the Natural History of Northumberland and Durham. That this magazine fills a useful place in the study of nature is evidenced, that in spite of the circumstances of the past four years so inauspicious for nature lovers, it has reached its fifth year of issue and is still going strong. Our colleague, Richard S. Bagnall, contributes a most instructive and suggestive article on the "Dancers of the Torrent," by which name he designates the Net-winged Midges the *Blepharoceridae*, illustrating it with several figures. Such articles as this attract a wider circulation than would matter limited to the primary object of the magazine. Articles dealing with other orders in the fauna, with the flora, and with the archeology are about equally shared, and last but not least in each number are a series of annotated recent records in the two counties dealing chiefly with plants, mammals, birds, insects, spiders, etc.

The R. Scuola Superiore d'Agricoltura in Portici (Italy) continues to issue annually its voluminous *Bollettino*, which has now reached its twelfth year of issue. The present volume contains among other papers:—(1) A Contribution to the knowledge of Agaonini (*Chalcididae*) of Giava, by G. Grandi. (2) Material for a Revision of the Diplopoda Oni-comorpha, by F. Silvestri. (3) An intensive study of the Bean-beetle (*Acanthoscelides obtectus*), by A. Razzauti. (4) An account of *Olethreutes variegana* (Tortricides) and its parasites, by Dr. R. Sarra. (5) A Contribution to a Knowledge of the *Coccidae* of Italy, by G. Leonardi. (6) A study of the intestinal digestive canal in insects with a view to understanding the diseases by which it is so frequently attacked, by Anna Foà, with a tinted plate. (7) A contribution to a Knowledge of the genus *Centrobia* (*Chalcididae*), by F. Silvestri. (8) The Chalcid of the *Cicada*, by F. Silvestri. (9) The genus *Thysada* (*Chalcididae*), by F. Silvestri. (10) A long paper on the Termites of West Africa. The present part deals with the various inhabitants of the mounds having symbiotic connection with the Termites, and is a most important contribution to general biology. There are a very large number of diagrammatic illustrations to all the papers.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.

October 2nd, 1918.—ALTERATION OF BYE-LAW.—The proposed alteration in Bye-law viii. was read for the second time.

LIFE-HISTORY OF *LYCAENA ALCON*.—Dr. Chapman exhibited a bred

specimen of *Lycaena alcon*, probably the first specimen that has been bred, certainly the first from larvæ taken in the autumn, and made observations on its life-history.

AN OUTDOOR SPECIMEN OF THE COCKROACH.—Mr. Donisthorpe exhibited a specimen of the common Cockroach (*Blatta orientalis*) taken under bark of oak in the New Forest, far away from any houses, July 29th, 1918. Dr. Neave and the President commented on this exhibit.

ERGATANDROMORPH OF MYRMICA SULCINODIS.—Mr. Donisthorpe also exhibited a curious ergatandromorph of *M. sulcinodis* taken on Bloxworth Heath, from the collection of the late Rev. O. Pickard-Cambridge.

LARVAL SKINS OF DYTISCUS MARGINALIS.—Mr. Hugh Main exhibited the three larval skins of *Dytiscus marginalis*, prepared for demonstration purposes.

PAPER.—The following paper was read, the author illustrating his subject with photographs shown in the epidiascope.

"Notes on Australian Sawflies, especially 'Authors' Types' and the Specimens in the British Museum of Natural History and the Hope Collection in the Oxford University Museum, with Diagnostic Synopses of the Genera and Species," by the Rev. F. D. Morice, M.A., F.E.S.

October 16th, 1918.—A RARE COCCID.—Mr. E. E. Green exhibited specimens of a rare Coccid (*Kermes quercus*) taken on the stem of a single oak, at Selby (Yorkshire).

EUPITHECIA HELVETICATA VAR. ARCEUTHATA AND LIVING LARVA.—Mr. W. G. Sheldon exhibited specimens of *helveticata* var. *arceuthata*, Frey, and a living larva from Surrey, and made observations on them.

NEW SUB-SPECIES OF HELICONIUS ERATO.—Mr. W. J. Kaye exhibited a remarkable new form of *Heliconius erato* which formed a connecting link between *H. erato* ab. *chestertoni* and *H. erato* ab. *colombina*.

LARVAL SKINS OF DYTISCUS MARGINALIS AND HYDROPHILUS PICEUS.—Mr. Hugh Main exhibited as transparencies in the epidiascope the larval skins of *Dytiscus marginalis*, which had been handed round at the meeting on October 2.

November 6th, 1918.—SPECIAL MEETING.—The Treasurer formally proposed to delete Clause 5 of Ch. viii., and to substitute:—

"The Council shall nominate a chartered or incorporated Accountant annually, who shall audit the Treasurer's accounts. The Auditor shall be paid for his services a fee, the amount of which shall be agreed by the Council on behalf of the Society. The Treasurer shall furnish the Accountant with all the facilities he may require for auditing the accounts."

The Treasurer having fully explained his reasons for proposing this alteration, it was seconded by Dr. Chapman and carried *nem. con.*

ORDINARY MEETING.—ELECTION OF FELLOWS.—The Rev. Fr. O'Neil, S.J., Salisbury, Rhodesia; Messrs. Ernest William Nimmy, 210, Whippendell Road, Watford, Herts; R. Stanway Parris, 6, High Street, Bishop's Stortford; the Rev. Alfred T. Stiff, Grantham, Victor Drive, Leigh-on-Sea; Capt. William Henry Tapp, F.R.A.S., F.R.G.S., and Mrs. Eleanor Eva Tapp, of Loos, 88, Wickham Way, Beckenham, Kent; and the Rev. E. Adrian Woodruffe-Peacock, F.L.S., F.G.S.,

Cadney Vicarage, Brigg, Lincolnshire, were elected Fellows of the Society.

ORTHOPTERA FROM SALONICA.—Mr. Lucas brought the Orthoptera sent from time to time by Mr. P. J. Barraud from Salonica, mainly for the sake of a very interesting form of the common earwig *Forficula auricularia*.

MACEDONIAN ORTHOPTERA.—Captain Burr exhibited a series of Orthoptera from Macedonia.

CHALCID IN UNDIGESTED SEED.—The President exhibited a Chalcid, *Torymus elegans*, Borkh., sent to him by the Rev. E. A. Woodruffe-Peacock, which had emerged from a hawthorn seed which had passed through the alimentary canal of a blackbird, together with the seed from which it had emerged.

BUTTERFLIES OF THE GENUS *CASTNIA* AND A MIMETIC *HESPERID*.—Mr. L. B. Prout, on behalf of Mr. J. J. Joicey, exhibited *Castnia erycina*, Westw. paratypes out of the Druce collection, together with an apparently very rare Erycinid butterfly (genus *Xenandria*?) erroneously described by Druce as "*Castnia*" *pelopia*, and also several new or doubtful forms of *Castnia*, not yet fully worked out.

DEATH OF A FELLOW.—Prof. Poulton said he was sure the Society would regret to hear that Mr. C. O. Farquharson, who had done so much valuable work in Africa, had been drowned in the sinking of the "Burutu" when on his way home on leave.

PAPER.—The following paper was read:—

"Notes on a large Heliconine Collection made in French Guiana in 1917, compared with a similar Collection made in 1915," by J. J. Joicey, F.E.S., and W. J. Kaye, F.E.S.

November 20th, 1918.—ELECTION OF A FELLOW.—Mr. Joseph Herrod-Hempsall, Orchard House, Stockingstone Road, Round Green, Luton, Beds., was elected a Fellow of the Society.

A NEW FORM OF *MORPHO EUGENIA*.—Mr. Arthur Dicksee exhibited three specimens of a new race of *Morpho eugenia* from Colombia, from which it was hitherto unknown, together with two *Morpho eugenia* from French Guiana, and one *Morpho adonis* from French Guiana, and another from the Lower Amazons for comparison.

BRED *LYCAENA ARION*.—Capt. Purefoy exhibited a score of home-bred *L. arion*, together with their pupa cases.

DARKENING OF HINDWING IN *MECHANITIS POLYMNIA*.—Mr. W. J. Kaye exhibited six female *Mechanitis polymnia* from the Berbice River, caught at Friendship in July, 1914, by Mr. H. C. Patoir, which all showed a very considerable darkening of the outer half of the hindwing, one in particular having the whole outer half black. Two female *M. polymnia* were also shown from the Potaro River, in Central British Guiana, which were the blackest that had been taken, one of which was figured in the *Trans. Ent. Soc.*, pl. xxiii., fig. 3, 1906.

PAPER.—The following paper was read:—"The Hymenoptera of Fiji," by Rowland E. Turner, F.E.S.

December 4th, 1918.—ELECTION OF FELLOWS.—Messrs. Anderson Fergusson, 22, Polworth Gardens, Glasgow, W.; George Grace, B.Sc., A.R.C.Sc., Inglenook, Utley, Keighley, Yorks, and P. V. Isaacs, B.A., Assistant Entomologist to the Madras Agricultural College and

Research Institute, Coimbatore, India, were elected Fellows of the Society.

NEUROPTERA FROM SALONICA.—Mr. W. J. Lucas exhibited the following *Neuroptera* from Salonica, sent to him by Mr. P. J. Barraud in 1916-1918, viz:—

Nemoptera sinuata, Oliv., three; *Formicaleo tetragrammicus*, Fabr., one; *Myrmecaelurus trigrammus*, Pall, one; *Palpares libelluloides*, Linn., two, a male and a female; *Osmylus chrysops*, Linn., two; *Ascalaphus macaronius*, Scop., var. *kolyvanensis*, Laxm., one male.

THE MALES OF GLUTOPHRISSA EPAPHIA AND PHRISURA SABINA DISTINGUISHED BY THEIR SCENT-SCALES.—Dr. F. A. Dixey exhibited specimens of the males and females of *G. epaphia* and *P. sabina*, with outline drawings of their scent-scales.

RHOPALOCERA FROM SOUTH CENTRAL AFRICA.—Mr. H. Dollman exhibited two series of some thirty specimens each of bred *Charaxes*: they represented two distinct species of the "*etheocles*" group, the one having the ♀ form of *manica* (resembling small ♀ *bohemanni*), the other having the ♀ form of *phaeus*, Hew. (resembling small ♂ *bohemanni*).

A LOCAL RACE OF *PRECIS OCTAVIA*.—Lord Rothschild exhibited a series of a local race of *Precis octavia* from Tembora, Bahr-el-Gazal, and drew attention to the extraordinary number of intermediate specimens among the series of the dry-season form—14 out of 16; also a series of wet- and dry-season forms with intermediates of *Precis octavia-octavia*, Cram., and *Precis octavia-sesamus*, Trimen, from West and South Africa respectively, for comparison.

PAPER.—The following paper was read:—

"Butterfly Vision," by H. Eltringham, M.A., D.Sc., F.E.S.

This was illustrated by the author by means of the epidiascope with drawings and photographs showing the way in which images of surrounding objects were presented to the view of insects, and also illustrating experiments on the colour perception of butterflies, from which it seemed certain that colours appear to them as they do to us.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

January 9th, 1919.—NEW MEMBER.—Mr. G. H. Cornish, Plumstead Common, was elected a member.

SURREY LEPIDOPTERA.—Mr. Ashdown exhibited numerous Lepidoptera taken in Surrey during 1918.

SECOND BROOD OF *A. THETIS*.—Mr. Buckstone, series of 2nd brood of *Agriades thetis* from Eastbourne and the Surrey Hills.

ABERRATIONS OF BRITISH BUTTERFLIES.—Mr. Frohawk:—(1) *Plebeius aegon*, very pale examples, with immaculate undersides of forewings, and slightly striated. (2) *Aricia medon* (*astrarche*), pale yellow marginal markings. (3) *Polyommatus icarus*, a female with pale yellow marginal markings.

ABERRATIONS OF ARGYNNIDS.—Mr. B. Adkin:—(1) *Argynnis aglaia*, pale specimen, with enlarged markings. (2) *A. cydippe* (*adippe*), pale specimen, a strongly banded underside. (3) A curious smoky *Strenia clathrata*.

H. CITRINALIS.—Mr. R. Adkin, two *Hypercallia citrinalis* (*christiernana*) from an old collection.

ITEMS IN SOME LIFE-HISTORIES.—Mr. H. Main, a species of *Anopheles* common at Eastbourne, and a series of photographs (enlargements) of

details of the Life-history of *Gastrophilus equi* and *Cristalis tenax* (Dip.), *Nepa cinerea*, and *Pentatoma prasina* (Hem.), etc.

REPORTS OF FIELD MEETINGS.—Mr. R. T. Bowman read a Report of the Field Meeting at Chingford, on May 25th.

Mr. E. Step communicated Reports of the Visit to the John Innes Horticultural Institution, and of the Fungus Foray on Wimbledon Common.

A NEMATOID WORM FROM A CAT.—Mr. S. Edwards exhibited the Nematoid worm, *Ascaris mystax*, from a cat, and the fungus *Peziza ventriculosa*, from a manure heap.

January 25th, 1919.—ANNUAL MEETING.—The Balance Sheet was adopted, the Report of the Council was passed, and the results of the election of Officers and Council for the ensuing year announced.

The President read his annual address, and after a short resumé of the work of the Society and the progress of Entomology generally for the past year, dealt with the work that was being taken up on the economic side of Entomology throughout the world.

Votes of thanks were passed to Officers and Council.

ORDINARY MEETING.—PHOTOGRAPHS.—Mr. Bunnett exhibited photographs of the details of the life-history of *Dasycera sulphurella*, and of some of the immature stages of the saw-fly *Phyllotoma aceris*.

AN EARLY RECORD.—Mr. Tonge, a *Phigalia pedaria* taken at Reigate on Nov. 24th last. The earliest date recorded.

ABERRATIONS OF *C. PAMPHILUS*.—Mr. Bowman, aberrations of *Coenonympha pamphilus*. (1) Very pale; (2) very wide margins; (3) very dark suffused undersides; (4) ocellations on undersides much emphasised.

ITALIAN LEPIDOPTERA.—Mr. H. J. Turner, a series of *Polyommatus dolus*. (1) Typical from near Florence; (2) ab. *vittata* from the Cevennes; (3) var. *menalcas* from Asia Minor; (4) the series in the Society's (Freeman) collection. He also showed a small male *P. icarus* (22 mm.) from Elba, and *Pieris manni* with gen. aes. *rossii* from the same place.

February 19th.—RARE COLEOPTERA.—Mr. Ashdown exhibited some of the Coleoptera referred to in the *Ent. Record*, December, 1918, viz., the rare streaked ab. *hebraea* of *Anatis ocellata*, apparently the second recorded British specimen, with *Mordella aculeata* and *Agrilus sinuatus* new to Surrey.

ABERRATIONS OF *A. URTICAE* AND *V. IO*.—Mr. Tatchell, *Vanessa io*, with aberrant ocelli on hindwings, *Aglais urticae* ab. *convexa*, a large *A. urticae* ab. *versicolor*, and the beautiful Fossorial Hymenopteron, *Mutilla europaea*.

A DIARY.—Mr. Coxhead, the diary of one of the crew of the famous "Challenger," and read extracts of a non-scientific criticism on the doings of the scientists aboard.

VARIATION IN *C. ALCIPHRON*.—Mr. Turner, a long series *Loweia* (*Chrysophanus*) *alciphron* from various localities, including (1) type from Buda, (2) *gordius* from the Alps, (3) *granadensis* from Spain, (4) ab. *intermedia* from Italy, (5) ab. *viduata*, (6) *meliboeus* from Bosnia, (7) ab. *subfasciata*, and (8) ab. *infultata* ♀.

D. ABIETELLA.—Mr. R. Adkin, captured and bred specimens of *Dioryctria abietella* from Forres, and read notes on the species, asking for information on details of its life-history hitherto unknown.

A SURREY RACE OF *V. io*, DWARF A. CORIDON.—Mr. A. W. Buckstone, bred series of *Vanessa io* from Surrey, including ab. *cyanosticta*, and referred to various minor aberrations and variations in their markings. He also showed drawings, by the Rev. C. R. N. Burrows, of the genitalia of the dwarf and other races of *Agriades coridon*, recently discussed, and read the comments received with the sketches.

C. NIGRICELLA IN ITS CASE.—Mr. Bunnett, details of the life-history of *Coleophora nigricella*, and read notes on the mode of progression of the case-bearing larva, with a series of photographs in illustration.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.

December 16th, 1918.—ANNUAL MEETING.—The reports of the Council, the Hon. Treasurer, and the Hon. Librarian were presented and adopted by the Meeting.

ELECTION OF OFFICERS AND COUNCIL.—The following were then elected as Officers and Council for the ensuing year, viz.:—*President*, Richard Wilding; *Vice-Presidents*, Wm. Webster, F.R.S.A.I., S. P. Doudney, Dr. G. B. Longstaff, M.A., F.E.S.; *Hon. Treasurer*, Dr. John Cotton; *Hon. Librarian*, F. N. Pierce, F.E.S.; *Hon. Sec.*, Wm. Mansbridge, F.E.S.; *Council*, Dr. P. F. Tinne, M.A., J. W. Griffin, H. F. Carter, F.E.S., Dr. E. A. Cockayne, M.A., F.L.S., W. A. Tyerman, Wm. Buckley, Prof. R. Newstead, M.Sc., F.R.S., G. F. Mathew, F.L.S., Leonard West, Capt. A. W. Boyd, M.C., F.E.S., Dr. A. Randell Jackson, and W. J. Lucas, B.A., F.E.S.

ANNUAL ADDRESS.—The President read an address in which he dealt with the folklore of insects and other creeping things. Many interesting superstitions and tales were discussed. The address will be printed in the Society's Report, and together with the same author's paper in the 1903 report, will form a very full account of this interesting subject.

January 20th, 1919.—PAPER.—Wm. W. A. Tyerman read a paper dealing with his captures of Micro-lepidoptera during 1917 and 1918 in the Liverpool district. This interesting paper enumerated 211 species many of them not having been recorded for S. W. Lancs. since the publication of the "Ellis List" in 1890; this good result is probably owing to much of the author's collecting having been done in places seldom visited by others. *Anacamptis albipalpella*, a single specimen taken at Formby, is an addition to the Lanc. and Ches. fauna. Mr. Tyerman exhibited the collection, and was heartily congratulated upon the very useful work he had accomplished.

PAPER.—Mr. W. Mansbridge then read a paper detailing his results in breeding *Aplecta nebulosa* and its varieties; he showed the different families obtained as the progeny of selected parents, and suggested how the black forms of the moth might arise in nature; he also stated that the percentage of black forms bred from wild larvæ obtained from a certain selected area had sensibly diminished in the last four years, while so far as known, there was no increase in any other part of Delamere Forest. Observations extending over the last fifteen years were embodied in the paper.

EXHIBITIONS.—Mr. Leonard West had a collection of larval cases of the caddis fly, some very curious forms of these little-known larval habitations being represented.

Subscriptions for Vol. XXXI. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 [This subscription includes all numbers published from January 15th to December 15th, 1919.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Ten Shillings, and must be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14. Cheques and Postal Orders should be made payable to H. E. PAGE.

During May and early June.—Pupæ: *Cinxia*, *Sibylla*, *Polychlorus*, *Villica*, 3/- doz.; 20/- per 100. *Z. trifolii* (Christchurch Warren), 7/- per 100. First 6 vols. of *Entomologists' Record*, well bound.—A. Ford, 36, Irving Road, Bournemouth.

New Cabinets and Apparatus.—Note: Finest make only, and best material only used.

12, 20, 30 and 40 drawer Cabinets in polished deal or mahogany. Specifications and prices on application.

Standard make Store Boxes, 10×8, 5/6; 13×9, 7/-; 14×10, 8/-; 16×11, 9/-; 17½×12, 10/-; postage 6d. extra. Special price by taking 12 or more of one size.

Insect and Egg Cases, Jointed Nets, Pins (Tayler's), Zinc Collecting Boxes, Setting Boards, Killing Tins, etc., etc.

Write for complete lists of set specimens, apparatus, larvæ and pupæ.

LEONARD TATCHELL, Lepidopterist, 43, Spratt Hall Road, Wanstead, E. 11.

Desiderata.—*Pieris napi*—spring and summer broods with exact data (localities and dates)—from all parts of the Kingdom, especially North of England and Scotland; *Pararge ægeria* from Scotland, Ireland, and North of England—exact data needed. Will do my best in return or pay cash.—G. T. Bethune-Baker, 19, Clarendon Road, Edgbaston.

Duplicates.—Varleyata and other varieties of *Grossulariata*. *Desiderata*.—Good varieties and local forms. *Spilosoma urticae*, *Advenaria*, and other ordinary species to renew old series. Good *Tortrices* and *Tineae*.—Geo. T. Porritt, Elm Lea, Dalton, Huddersfield.

Duplicates.—*Grossulariata* var. *lutea*, *lacticolor*, *varleyata*, *fulvaticata*, etc. *Desiderata*.—Other extreme forms of *Grossulariata*, or good vars. of *Diurni*.—Rev. G. H. Raynor, Hazeleigh Rectory, Maldon, Essex.

Desiderata.—*Euchloë cardamines* from Ireland; also types of *E. cardamines* from Switzerland, Italy, S. France; var. *turritis* (S. Italy), var. *volgensis*, var. *thibetana*, and of *E. gruneri*, *E. euphenoides*, *E. damone*, and any paleartic species of the genus. *Duplicates*.—*Loveia doris* and vars., a few minor vars. of *R. phleas* (British), and many British lepidoptera.—Harold B. Williams, 82, Fifeley Avenue, Stoke Newington; N.

Duplicates.—*A. coridon* vars., including semi-syngrapha, *H. Comma*. *Desiderata*.—*A. coridon* var. *albicans* (Spanish) and var. *Hispana* (do.), and good butterfly vars., especially from Ireland.—Douglas H. Pearson, Chilwell House, Chilwell, Notts.

Duplicates (all Clydesdale).—*Æthiops*, *Selene*, *Icarus*, *Phleas*, *Hectus*, *Mundana*, *Perla*, *Fulva*, *Nictitans*, *Tritici*, *Chi*, *Boreata*, *Cambrica*, *Belgaria*, *Immanata*, *Olivata*, *Tristata*, *Boreata*, *Mercurella*, *Angustea*, *Dubitalis*, *Ambigua*, *Truncicolella*, *Derepitalis*, *Kuhmella*, *Fusca*, *Margaritellus*, *Hortuella*, *Hyemana*, *Phryganella*, *Ferrugana*, *Solan-drinana*, *Sponsana*, *Conwayana*, *Stramineana*, *Rivulana*, *Urticana*, *Octomaculana*, *Perlepidana*, *Vaccinana*, *Geminana*, *Herbosana*, *Myllerana*. *Desiderata*.—Numerous, especially.—A. A. Dalglish, 7, Keir Street, Glasgow.

Duplicates.—*Janira*, *napi*, *cardamines*, *Artemis*, *P. interrogationis*, *P. festucae*, *P. bractea*, *D. conspersa*, *Haslata* (all Irish). *Desiderata*.—*Machaon*, *Artemis* (English), *Cinxia*, *Athalia*, *Cardui*, *Galatea*, *Epiphron*, *Lucina*, *Actæon*, *Sylvanus*, *Comma*. All perfect, well set on black pins.—Charles Langham, Tempo Manor, Co. Fermanagh, Ireland.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. 1919, Oct. 1st, Oct. 15th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—Hon. Sec., Stanley Edwards, 15, St. German's Place, Blackheath, S.E. 3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society).—Hall 20, Salisbury House Finsbury Circus, E.C. The First and Third Tuesday in the month, at 7 p.m. Visitors invited. Hon. Sec., J. Ross, 18, Queens Grove Road, Chingford, N.E.

All MS. and editorial matter should be sent and all proofs returned to Hy. J. TURNER, 98, Drakefell Road, New Cross, London, S.E.14

We must earnestly request our correspondents NOT to send us communications IDENTICAL with those they are sending to other magazines.

Lists of DUPLICATES and DESIDERATA should be sent direct to Mr. H. E. Page, Bertrose, Gellatly Road, New Cross, S.E. 14

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

H. W. HEAD, Entomologist,
BURNISTON, Nr. SEARBOROUGH.

Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

G. A. Bentall, F.Z.S.,

~ NATURALIST. ~

Carton Store Boxes. $15\frac{1}{2} \times 10\frac{1}{2} \times 2\frac{1}{2}$ ", wood sides, hinged lids, covered dark leather paper, lined white inside, cork bottom. 3s. 9d. each.

Whitewood Double Store Boxes. Lined top and bottom cork Napthaline cell.

$10 \times 8 \times 3$ "	$14 \times 10 \times 3$ "	$17 \times 12 \times 3$ "
7s. 9d.	9s. 6d.	10s. 9d.

Stained and polished Mahogany colour.

10s. 9d.	12s. 6d.	14s. 9d.
----------	----------	----------

Also stocked in Walnut same price as Whitewood.

Whitewood Travelling Setting Houses. $16 \times 12 \times 4\frac{1}{2}$ ", hinged ends and lid, perforated Zinc both ends. 13s. 6d. each; setting boards extra.

Superior Oval Cork Setting Boards. 14 inches long.

$2\frac{1}{2}$ "	$3\frac{1}{2}$ "	1"	$1\frac{1}{2}$ "	$1\frac{3}{4}$ "	2"	$2\frac{1}{2}$ "	3"	$3\frac{1}{2}$ "	4ins.
2s. 6d.	7s. 3d.	1s.	1s. 3d.	1s. 4d.	1s. 6d.	2s.	2s. 3d.	2s. 6d.	3s.

40-drawer New Entomological Cabinets, with Mahogany panel doors, £85 each.

Full specification of same can be supplied.

Cork Sheets—

$11\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{8}$ "	$11\frac{1}{2} \times 3\frac{1}{2} \times \frac{3}{16}$ "	$11\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{4}$ "
2s. 0d. doz. sheets.	3s. 6d. doz. sheets.	4s. 6d. doz. sheets.

Kirby Beard's Entomological Pins—

Size	1	3	5	8	10
White	1s. 3d.	1s. 3d.	2s. 0d.	2s. 9d.	3s. 9d. per oz.
Black	2s. 6d.	2s. 6d.	3s. 3d.	3s. 9d.	5s. 0d. do. do.

Strong Glass Killing Jars, fitted with cork, 2s. each; larger size, 2s. 6d.

Pine Breeding Cages for low feeding larvae $16 \times 12 \times 7\frac{1}{2}$ ", with perforated zinc lid. 10. 6d. each.

Round Chipette Boxes, very strong—

$1\frac{1}{2} \times 1\frac{1}{2}$ "	$1\frac{3}{4} \times 1\frac{1}{4}$ "	$2 \times 1\frac{1}{2}$ "
3d. doz.	4d. doz.	5d. doz.

Round White Metal Boxes—

$1\frac{3}{4} \times \frac{3}{4}$ "	$2 \times \frac{3}{4}$ "	$2\frac{3}{4} \times 1\frac{1}{8}$ "	3×2 "
6d. doz.	7s. 3d. doz.	3d. doz.	1s. 9d. doz.

Strong Canvas Bag for Larvæ Collecting, Sallows, etc. 17×30 ". 2s. each.

Pattern of material sent post free.

Folding Brass Adjustable Pocket Net with Screw, to fit any stick. 6s. 9d. each.

Tracing-Paper for Setting Insects. 20×30 ". 3d. sheet; samples free.

White Tiffany (soft finish) for Sleeving, etc. 30" wide. 10s. 3d. yard; samples free.

Blue Steel Glass-headed Pins. $1\frac{1}{2}$ " long, for setting with tracing-paper. 6s. 3d. box of 4 doz. pins.

Price Lists, post free, on request.

DUDLEY HOUSE, SOUTHAMPTON ST. (opposite Hotel Cecil),
STRAND, W.C. 2.

Next Issue will be on Sept. 15th.

Vol. XXXI.

13.820

No. 7.

The Entomologist's Record

AND

Journal of Variation

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.
GEORGE T. BETHUNE-BAKER,
F.Z.S., F.L.S., F.E.S.
M. BURR, D.SC., F.Z.S., F.L.S., F.E.S.
(REV.) C. R. N. BURROWS, F.E.S.
(REV.) GEORGE WHEELER, M.A., F.E.S.,
and
HENRY J. TURNER, F.E.S.,
Editorial Secretary.

T. A. CHAPMAN, M.D., F.R.S., F.E.S.
JAS. E. COLLIN, F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.
JOHN HARTLEY DURRANT, F.E.S.
ALFRED SICH, F.E.S.

CONTENTS.

	PAGE
Seasonal Polymorphism of European Rhopalocera, <i>Roger Verity, M.D.</i>	121
NOTES ON COLLECTING :—References for Localities, <i>C.R.N.B.</i> and <i>H.J.T.</i> : <i>Papilio machaon</i> in Surrey, <i>H. Speyer</i> ; Notes on Entomology in France and Italy in 1918, <i>C. B. Ashby, F.E.S.</i>	129
CURRENT NOTES AND SHORT NOTICES	134
SOCIETIES :—The South London Entomological Society ; The Lancashire and Cheshire Entomological Society	137
SUPPLEMENT :—The completion is still held over.	
September Number will be double.	

JULY 15th, 1919.

Price ONE SHILLING (NET).

Subscription for Complete Volume, post free
(Including all DOUBLE NUMBERS, etc.)

TEN SHILLINGS,
TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,
"BERTROSE," GELLATLY ROAD, NEW CROSS, S.E.14.

Communications have been received or have been promised from Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, C. P. Pickett, Parkinson Curtis, H. Donisthorpe, A. Sich, Dr. Verity, C. W. Colthrup, Rev. C. R. N. Burrows, Dr. T. A. Chapman, Capt. Burr, G. T. Bethune-Baker, E. B. Ashby, P. A. H. Muschamp, J. H. Durrant, Orazio Querci, Rev. F. D. Morice, with Reports of Societies and Reviews.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/5, 2/2, 2/6, 3/2. Folding Nets, 3/9, 4/3, 4/9. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 7d., 10d., 1/2, 1/10. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 9d. per four dozen, 1 gross, 2/-. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/7 per tin. Store-Boxes, with camphor cells, 2/3, 2/9, 4/- 4/6, 5/6, 6/8. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 5/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 10/6, 12/9; corked back, 15/9. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/9, 4/6, 5/6, 8/3. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/9 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, 1/2 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 6/6. Glass-top and Glass-bottomed Boxes, from 1/3 per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d., 1/-; Blowpipes, 4d., 6d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families and for all insects liable to become greasy.

We stock various sizes and lengths of these Silver Pins which have certain advantages over ordinary entomological pins (whether enamelled black or silver or gilt).

NESTING BOXES of various patterns which should be fixed in gardens or shrubberies by lovers of birds before the breeding season.

SHOW ROOM FOR CABINETS

Of every description for INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS &c.

Catalogue (84 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic),
Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.

Bexley]

L. W. NEWMAN

[Kent

Has for sale a superb stock of 1918 specimens in fine condition, including Varleyata; Bicuspis; Pendularia var. Subroseata; Melanic forms Lariciata, Consortaria, Consonaria, Abietaria; Irish forms Aurinia and Napi, fine vars. Tiliæ, Yellow Dominula, etc., etc. Quotations and Insects sent on approval with pleasure.

Also a huge stock of fine PUPÆ and OVA.

Write for latest price lists.

NOTICE:—Owing to huge rise in cost of metal, etc., my **Relaxing Tins** are now **3/6** small and **5/6** large, post free.

GALLS AND PIERCED BRAMBLE AND BRIER STEMS.—MR.

L. A. BOX would be very grateful for any sorts and quantities, with localities, from all parts of the United Kingdom.

80, Northampton Road, Croydon.

Seasonal Polymorphism and Races of some European Grypocera and Rhopalocera.

By ROGER VERITY, M.D.

(Continued from page 89.)

[CORRECTION.—On page 87, four lines under *Pontia daplidice*, "In Sicily the most . . . I call it *AMPLA*," unfortunately were misplaced, and should come under *Colias croceus* above.—H.J.T.]

Coenonympha pamphilus, L., RACE *EMIAUSTRALIS*, mihi; RACE *EMILYLLUS*, mihi; RACE *GIGAS*, mihi. I have already mentioned in the *Ent. Record* xxviii., p. 171, how interesting I consider this species from the point of view of variation, and I have given a summary of its geographical variations in Europe and Africa. I have since then been able to procure a still larger material and I have gone into the subject more thoroughly. I have noted that in the southern part of Central Europe this species does not belong any more to the nymotypical race, but already resembles entirely on the underside and in the first generation the southern race I have called *australis*; on the upperside, on the contrary, it is quite similar to the former by its pale grey marginal band and by the total absence of it in some females; the second generation belongs to the *aestivalis*, Rocci form. Taking as typical a series of the first brood from Geneva, I should call this transitional race *emiaustralis*. In the April number of the *Ent. Record* for this year I have, at page 71, outlined the very marked seasonal variations of *australis* in Florence, producing successively the forms: *murina*, Vrtý., *australis*, Vrtý., *emilyllus*, Vrtý., *aestivalis*, Rocci, and again *murina*. The name *emilyllus* I created for the distinct summer form, which is produced in many southern localities in July and at the beginning of August, constituting the first group of the bipartite second generation, and distinguished by its underside of an uniform light tawny colour, with well marked eye-spots, and very often by the marginal band of the upperside being divided in two. The discovery of this form has led me to modify my views as to the possible specific distinction of *lyllus*, Esp. from *pamphilus*, L.; it is evidently a perfect transition from one to the other; I also possess a transitional male specimen from Martigny, in the Valais, in which the marginal band is divided in two, but in this case the underside has no resemblance to *lyllus* [form *BIPERTITA*, mihi]; moreover, in a large series of the first brood *lyllides* of *lyllus* collected by the Quercis in Sicily, I have found a few specimens exactly resembling *australis* from Tuscany; all this shows the two blend together in several ways and are only geographical variations, probably simply produced by their surroundings. I should extend the name *emilyllus* to those races in which this form predominates in the first group of the second generation, as even in Tuscany there are localities where *aestivalis*, on the contrary, constitutes the whole of the latter generation. It must be noted that in Central Italy *australis* in both generations has a tendency to produce a very wide and very dark black marginal band; Rühl observes that it is much darker than in his *marginata* from Asia Minor, in which it tends to be brownish; our more extensive knowledge of the variations of this species now clearly shows that *marginata* is a modified form of *lyllus*,

JULY 15TH, 1919.

similar to the African race, which produces the extreme form *latevittata*, Vrtý.; Rühl's name must not in consequence be used for forms of *australis* with a wide margin, such as those of Central Italy, and a new name is necessary for the latter; I propose the name *LATENIGRATA*, taking as types specimens in which the black extends inwards beyond the black spots of the ocelli; such examples are, however, rare, and the name must of course be used for all local races with a wide black margin which produce the extreme form occasionally. Another race of the group *lyllus* worthy of particular notice is the magnificent giant one of Sicily, with an expanse of 24-26mm. in the male and of 25-35mm. in the female: race *GIGAS*; typical series from Palermo. The geographical variations of *pamphilus* can be summarised as follows:—

ONE GENERATION ONLY.

Group *pamphilus*.

Race *scota*, Vrtý., extreme Northern parts of Europe.

Race *pamphilus*, L., Northern Europe.

TWO GENERATIONS.

Group *pamphilus*.

First gen.

Second gen.

Race *pamphilus*, L.

pamphilus, L.

pamphilus, L.

Northern part of Central Europe.

Group *australis*.

Race *emiaustralis*, Vrtý. *emiaustralis*, Vrtý. *aestivalis*, Rocci.
Southern part of Central Europe and high mountains of
Southern Europe.

Race *australis*, Vrtý. *australis*, Vrtý. *aestivalis*, Rocci.
Southern Europe.

Race *emilyllus*, Vrtý. *australis*, Vrtý. *emilyllus*, Vrtý.
Southern Europe.

Race *latenigrata*, Vrtý., Southern Europe.

Group *lyllus*.

Race *lyllus*, Esp. *lyllides*, Vrtý. *lyllus*, Esp.
Portugal and extreme parts of Southern Europe.

Race *gigas*, Vrtý. *lyllides*, Vrtý. *gigas*, Vrtý.
Sicily, etc.

Race *marginata*, Rühl. *lyllides*, Vrtý. *marginata*, Rühl.
Asia Minor.

Race *latevittata*, Vrtý. *lyllides*, Vrtý. *latevittata*, Vrtý.
Algeria.

Race *torrida*, Vrtý. *lyllides*, Vrtý. *torrida*, Vrtý.
Sardinia.

N.B.—The localities of the five races last mentioned are those of “types,” but they probably intermingle in these regions, providing local races in all of them.

Coenonympha dorus, Esp. A male of this species was collected on

July 18th, 1918, at the back of the fountain of the village of Bolognola, 1200m., in the Sibillini mountains; it had never been found before in Italy.* The specimen is quite similar to the nymotypical race of Southern France ("type" of Esper from "the mountains of Languedoc"), and in no way resembles the more southern *andalusica*, Rühl, of Spain; it is, however, much smaller than the usual French examples.

Coenonympha arcanius, L., race *tenuelimbo*, Vrtý., second gen. GRACILIS, mihi. I have already observed in the *Bull. Soc. Ent. Ital.*, xlv., p. 223 (1914), that curiously enough all the races of this species had been described as having a wider black marginal band than the nymotypical race, whereas in reality the latter from Scandinavia, including the specimen left to us by Linneus, has the widest possible band. In consequence *insubrica*, Frey., can only be described as larger, and *macromma*, Turati and Vrtý., as having larger ocelli. I there described two narrow-banded races: the gigantic *opposita* from Calabria, and the widely distributed southern race *tenuelimbo*, the types of which are from Tuscany, but which I possess from the Valais, from Barcelona, etc. Having established that the latter produces a partial second generation in August and at the beginning of September, I propose to distinguish it, as has been done in all the other species, by a name, calling it *gracilis*, on account of its constantly frailer build and smaller size than the first generation of May and June.

Pyronia tithonus, L., race *ETRUSCA*, mihi. The nymotypical race is a German one. I have already shown that the British race *britanniae*, Vrtý. (see *Ent. Record*, xxviii., p. 169), differs markedly from the one of Central Europe in being darker and having larger eye-spots. In Tuscany there exist two distinct races, the extremes being found on the coast and in the colder mountain localities; strangely enough the former is similar to the Central European one, and the latter differs from it in a diametrically opposite direction to *britanniae*, the dryness of the Italian mountains evidently having more effect than the warm, but moist, sea air; the fulvous colour is yellowish, and in the female often very pallid, in which case the marginal band is grayish; the basal shadowing is very inconspicuous or even absent; in the male the androconial patch is limited in extent and greyish, or even of a fulvous not much darker than the ground colour; the black marginal band is narrow, and often does not reach as far as the ocellus of the hindwing; the apical ocellus is small and no other supplementary ones ever appear; on the underside the apical part of the forewing and the hindwing are suffused with a brightish yellow tinge, covering also the otherwise dull and pale markings, especially in the female. I take as typical of this *etrusca*, my series of the Mt. Conca, a cold locality near Florence; in other localities, lower and less exposed to northern winds, such as the Pian di Mugnone, a transitional (TRANSIENS) race to the one of the coast is to be found. Turati has called *fulgens* the Sardinian race, with wide-spread black markings above and bright yellow underside.

Epinephele jurtina, L., race *EMIHISPULLA*, mihi, and race *TELMESSI-AEFORMIS*, mihi. The name *hispulla*, Esp., has been misapplied by a

* This is quite a mistake. I took it not uncommonly at Asisi in July, 1909; see *Ent. Rec.*, 1909, p. 252.—G.W.

great many authors. Esper and Hübner figured two specimens collected at Lisbon, and belonging to a race which in the scale of variation of the species comes nearest to the giant race of Africa and Sicily generally known under the name of *fortunata*, Alph.; true *hispulla* is also found in Sardinia, but on no account does it occur in continental Italy, and still less in Switzerland, even as individual variation; Frùhs-torfer rightly pointed this out and gave the name *phormia* to the races of the warmer valleys of the Alpine region, wrongly called *hispulla* by many, and brighter than the one figured under this name by Seitz; the race of Northern Europe, which I think ought to be called *janira*, L., extends as far south as Central Italy, at very high altitudes, but *phormia* otherwise generally represents the species in the latter country. I must now add that the gap between *phormia* and *hispulla* is still so great that a further grade is clearly discernible; such is the race found in the Isle of Elba, and probably also in southern Italy; extreme individual variations reach both *phormia* and *hispulla*, but the great majority are intermediate; I should call it *emihispulla*.

Another mistake commonly made in this species must be emphasised: it was shown by Le Cerf [*Bull. Soc. Ent. France*, 1912, p. 225] that *telmessia*, Zeller, is a distinct species with very different "genitalia" from *jurtina*; the latter is also found in the East, and it often resembles the former to such a degree that an examination of the genitalia is required to separate them; this very distinct race had thus always been mixed up with *telmessia*, but it is high time it should be recognised and named *telmessiaeformis*.

Erebia ceto, Hüb., race ABETONICA, mihi. This race differs from all others by the extent of the fulvous spaces; in extreme female examples they form a continuous wide band across the wing; it is a grade further than *cetra*, Frhst., of the Maritime Alps, and it also differs from it by the much warmer reddish tinge of the black scaling. I found it abundantly on Mount Majori, 1500m., near the Abetone Pass. It is noteworthy that further south, in the Sibillini Mountains, the opposite variation of the species, *obscura*, Rätzer, is produced.

Erebia stygne, O., race ETRURIAE, mihi. The same contrast as in the preceding species exists between the races of the Abetone region and that of the Sibillini; the latter belongs to *valesiaca*, Elwes, renamed *rühli*, Frhst., that name existing already in the genus; the former comes near to the most vividly marked race *cubei*, Frhst., of the Maritime Alps, but lacks the whitish band-like space on the underside of the hindwings, and is slightly less fulvous on the upperside.

Erebia goante, Esp., race VALDERENSIS, mihi, and race APENNINIGENA, mihi. Esper's type was from the "Thalalpen" of Lucerne. The race of the Valdieri Baths, 1435m., in the Maritime Alps, differs from it as follows: both the black and the fulvous colour are darker; the latter is very much less in extent, often not reaching further back than the second cubital nervure; the eye-like spots are smaller and may be absent on hindwings; the underside is more variegated, a deep black pattern contrasting sharply with a silvery-white ground colour.

The race collected at Arpetto, in the Ligurian Apennines, has the fulvous spaces and ocelli still more reduced than in *valderensis*, but the

underside is less variegated; in the male it is much darker than in the nymotypical race, whereas in the female it is, on the contrary, very white, the pattern being quite inconspicuous; the fulvous colour is even paler and more yellowish than in the Swiss race on both surfaces.

Erebja tyndarus, Esp., race INFRAGENTEA, mihi. Oberthür, in the *Ét. Léop. Comp.*, iii., p. 337, describes the beautiful Italian race belonging to the group *cassioides*, Esp., which I have figured in *Bull. Soc. Ent. Ital.*, xlv., pl. i., figs. 15 and 16, as a contrast to the less conspicuous *tusca*, Vrtý.; he thinks the name *cleo*, Hüb., is well suited to the former, and that, as this author gives no locality for his type, it might even be Italian; looking over Hübner I find that the locality is given in a small supplement to the text of *Rhopalocera*, published later in a Part dealing with *Heterocera*, and that "Austria, Tyrol, and Switzerland" are mentioned. The Italian race certainly is very different from any of this region by its brilliant silvery underside and other characters, coming nearer to Spanish races, and is well worthy of a name. The pair figured by me may be taken as types.

Melanargia galathea, L., race FLORENTINA, mihi; race MONTICOLA, mihi; MICROPROCIDA, mihi; race PANORMITANA, mihi. I cannot enter here on a long discussion of the fascinating geographical variations of this species; I can only give the following summary of the western races. On its individual variation I have written a monograph, which I hope to be able to publish very soon.

I. Group *serena*.

Race *serena*, Vrtý., England, N. of France.

Race *pygmaea*, Frhst., Neuchâtel, Canton de Vaud, Jura Vaudois, Geneva, Isère (transition to *procida*), Haute Savoie.

Race *florina*, Frhst., Southern slopes of Simplon, Canton Tessin.

Race *nereus*, Frhst., Valley of the Rhone in the Valais.

Race *doris*, Frhst., Digne.

II. Group *procida*.

Race *monticola*, Vrtý., High and medium altitudes in Central Italy.

Race *florentina*, Vrtý., Plains of Central Italy.

Race *pyraenaica*, Vrtý., Hautes Pyrénées (Gédre).

Race *microprocida*, Vrtý., Benevento in Southern Italy; also Vetricolo in the Tyrol.

Race *procida*, Herbst & Jabl., Provence and Piedmont; also the Eastern coast of the Adriatic.

III. Group *turcica*.

Race *turcica*, B., the Balkans.

Race *calabra*, Vrtý., High altitudes in Calabria.

IV. Group and race *panormitana*, Vrtý., Sicily (typical series from Palermo).

The race *florentina* shows a striking combination of the characters of the *procida* and of the *serena* group; on the outer part of the wings the black pattern is, as in the former, very expanded, and the pre-marginal white spaces very reduced in consequence; on the inner part the discocellular and the basal pattern are as reduced in extent as in

pygmaea; on the underside the thick, deep black markings and large ocelli belong to the *procida* group, but the light grey shadowing, contrasting with the black streaks, are as in *pygmaea* (in race *procida* the grey scaling is replaced by black). The minimum, medium, and maximum size, as shown by the expanse between the apex of the forewing, where the fringes begin, are, in the male, 35mm., 38mm., 41mm., in the female, 38mm., 44mm., 50mm.

The race *monticola* may be described as the most variable produced by the species, and is the smallest; the measures corresponding to the above are as follows: in male, 31mm., 33mm., 39mm., in female, 34mm., 39mm., 45mm. Extreme variations come close to *serena* and to *procida*, so that they seem to compensate each other and give a medium pattern very similar to the medium of *florentina*, which is very natural, as this is only its mountain race; amongst its individual forms, which never occur in the latter, the most striking are: females with yellow ground-colour; others with a white circle round the ocelli above; others with the two black marginal capillary streaks distinctly separated from each other above; some of the form *vispardi*, Jullien; others with a complete series of wide premarginal white spaces above, across the whole wing.

In *pyraenaica* the black streaks, of underside are extremely dark, thick, and sharply defined, and the ocelli large, making it undoubtedly a race of the *procida* group, but the grey scaling is of a very light tinge, contrasting with the black pattern more than in other races; pattern above similar in extent to that of *pygmaea*; size small, as in the latter.

In *microprocida* the size is not superior to that of *pygmaea*, the pattern otherwise corresponding to the darkest *procida* races.

The large Sicilian *galathea* stands apart in the variations of the species. The first impression on examining a series of males is that the race belongs to *procida*; a closer inspection also reveals in fact many specimens of the most marked *procida* type on both surfaces, but some are found with a complete series of premarginal white spaces and with eye-spots encircled by a white ring, as in some *serena*, but in no other Italian males; these and other specimens have on the underside a pattern of very fine black streaks and the grey scaling scarcely discernible; all these characters evidently show a tendency to acquire the aspect of the African *lucasi*, Rbr., which in consequence is probably but a subspecies of *galathea*. In the females the resemblance is still more striking in some individuals of large size, with acuminate wings and reduced pattern on both surfaces, whereas others are quite of the *procida* type.

Pararge megera, L. The variations of this species, both geographical and seasonal, are very limited. *Caledonia*, Vrtý., and *lyssa*, Boisd., constitute the extremes as regards the first; in Greece and Asia Minor a race is found in which the underside is similar to *lyssa* by the total lack of grey scaling on the underside of hindwings, but in which the black pattern of the upperside is not reduced in extent as in the latter from Dalmatia; it is worth naming *EMILYSSA* (types in my collection from the Bosphorus); both this and *lyssa* are found now and then in Tuscany in the second and third generation; in hot localities a form is also found with more elongated and acuminate wings, and with the external margin less convex (form *PORRECTA*, mihi); the occurrence of

these forms and a very slight reduction of the black pattern on the whole constitute the only seasonal characters I have been able to detect in the summer generations, as compared to the first generation, *australis*, Zeller, to which *tigeliiformis*, Vrtý., is perhaps equivalent, are also probably forms found only at the hottest time of the year.

Pararge maera, L., subspecies *vulgaris*, Vrtý., race *appennina*, Vrtý. The name *adrasta*, Hüb., appears abusively in lists of every sort of region, and has thus nearly lost all meaning, as in all the races of the group *vulgaris* females are found with an extensive fulvous patch on the forewings. On the contrary, true female *adrasta*, as figured by Hübner, with no trace of dark shading even at the base, with a vivid colouring, and with elongated wings, constitutes a well-defined race found in certain regions, such as the south of France, according to Wheeler, in the second brood of the hottest localities. In Tuscany some males come near that of *adrasta*, and very rare examples of the other sex are similar to it as regards the extent of the fulvous, but not in size, brightness, shape, and other minor characters. I propose to make a clear distinction between the race of Hübner and extensively fulvous specimens of other races by naming the latter *ADRASTAEFORMIS*.

Pararge aegeria, L., subspecies *egerides*, Stmgr., race *italica*, Vrtý. I have not been able to detect any seasonal variation in the three broods of Tuscany; individual variation is, on the contrary, very great, and I find, mixed together with characteristic bright fulvous *italica*, specimens which correspond exactly to Frühstorfer's races *elegantia*, *camoena*, and *egestas*, and which I think should be called *ELEGANTIAEFORMIS*, *CAMOENAEFORMIS*, and *EGESTASIFORMIS*. I notice only that typical *italica* is more frequent in the early spring and late autumn, and that in hot localities and seasons the very dark *camoenaeformis* occurs more often. I must mention the interesting aberration in which the brown pattern is so reduced in extent as to be quite similar to that of female *megea*, the fulvous so-called "spots" blending together and revealing their true origin from the ground-colour. In Tuscany I have only found females, but I have a male from Vendée of the race *intermedia*, as described below. I should call this ab. *ATAVICA*.

I have tried to clear up the entangled question of the name *intermedia*, which has been given all sorts of meanings by different authors. Rühl, in *Pal. Gross-schunett*, p. 581 (1895), seems to be the first who introduced it in literature, and he has the right of priority; he says it has been given (evidently by collectors) to transitions between the nymotypical *aegeria* and *egerides*, such as those found in Naples and other localities. I possess races exactly answering this description from Vendée, the Pyrennes, and Sicily, which are really intermediate in all the numerous characters distinguishing *aegeria* from *egerides* (see *Ent. Record*, xxviii., p. 166). Tutt, in 1896, gives the same name to specimens which are intermediate as regards the tinge of the fulvous colouring, but he seems to have overlooked all the other much more important characters; such a description would have been very misleading, because *italica*, although it is a pure *egerides*, is just as brightly fulvous as *aegeria*; it would have included both *intermedia*, Rühl, and *elegantia*, Frhst., which are entirely different from each other. Seitz next publishes the same name, attributing it to Weismann, and figur-

ing a female with a mixture of fulvous and whitish spaces, which, according to him, represents a distinct race from Liguria (Genoa); it must here be observed that Weismann never gave the name at all, but simply mentioned an intermediate race from that locality, and secondly that such a race in no way exists there. Rocci kindly collected a series for me, and I find it is identical with the Florentine one, *i.e.*, *egerides*, race *italica*, with not a vestige of *aegeria*, and whitish markings only in worn female specimens.

Satyrus statilius, Hufn. I have in my original paper made a survey of the very numerous local races of this very variable species, and shown that they can easily be grouped according to certain characters corresponding to more extensive regions: Northern group, Hiberio-African group, group of the lowlands of the rest of Southern Europe, group of the mountains of Southern France, group of the Apennine and also of lower localities of Central Italy when not under the influence of maritime climate. It would be too long even to make a summary of the characters of these groups and of their races, so that I am obliged to limit myself here to a few observations. *Allionia*, Fabr., is one of those names which has been widely used abusively, all the large southern races having been included in it, no matter how different they were from each other. The original description is very brief, and the only clue we have as to the race it should be restricted to is the locality of the type, Portugal; this at once limits it to the very distinct Hiberio-African group and excludes it from any race of all the other groups. A race which has not yet been described is that of S.-W. France, which I propose calling *BURDIGALÆ*, from a series from Bordeaux in my coll.; its small size and very slightly scalloped wings would include it in the northern group of races, but the deep black pattern of the underside, standing out on a white ground-colour, make it more similar to the southern races, so that the mixture of characters makes it quite distinct and transitional. In the S.-E. of France a form is produced quite different from all others by the unusually wide white band, which crosses both fore- and hindwing on underside, and by the washing of white scales on the latter, which reduces the whole of the dark pattern in extent and sharpness, producing an effect rather as in the *fidia* of that region; I should call it *FIDIAEFORMIS* (types from Grasse in my coll.): it flies with other individual forms similar to *marmorea*, Vrtz., in which the white is extensive, but the black pattern is also prominent; the latter is the prevailing form on the south side of the Gulf of Spezia; further south it becomes very rare, and it is replaced on the Tuscan coast by *MICROMARITIMA*; here the white spaces are very much reduced and to a great extent replaced by a gray shadowing, which shows off the black pattern less well. Still further south, in the Latium and down to Sicily, a similar race, but of much larger size, in fact one of the largest known, exists; it has been called *maritima* by Rostagno, but unfortunately this name was preoccupied by Oberthür for a race of *briseis*, so that it is necessary to substitute it by that of *ROSTAGNOI*. Another transitional race, like *burdigalæ*, between the northern and the southern group exists in Lower Austria (*NORICA*, *mibi*); it is small, has but slightly scalloped wings, and the upperside is light brown, very light in female; on the other hand the underside of hindwings is very variegated, on account of a wide white

band-like space and of a suffusion of white scales also at base, reminding one distinctly of that character in *fidiaeformis*; the two median streaks and the dark shading round the ocelli are not black, but dark brown. Still another interesting race is that which flies in the country of *fatua*, and which acquires a superficial resemblance to it, so much so that I should call it *FATUAEFORMIS*, describing it from specimens of Phanaraki in Asia Minor; it is small and but little scalloped; the male is deep black above; ocellus of apex small and very prominently encircled by fulvous on underside; white band of forewings on this surface rather wide, whereas on hindwing it is not proportionately developed, and grey instead of white; moreover it is entirely covered over by a dense veil of extremely minute and fine streaks (compare with *crassemaculosa*, Vrtý., of certain Italian localities, such as the north side of the Gulf of Spezia, in which they are much thicker, coarser, and less numerous); the two median streaks and the shading round ocelli are dark chestnut and inconspicuous; in the female an indistinct median greyish band is discernible on the upperside, and the two ocelli of forewing are surrounded by a wide fulvous space, sharply defined outwardly, such as is frequent in *fatua*, but exists in no other *statilinus* I know of.

Satyrus circe, Fabr., race *ITALA*, mihi. The male generally has an expanse of 58mm., but often even of 62mm.; the female generally varies from 65mm. to 70mm., but I possess one of 80mm.; evidently comes very near the giant *illecebra*, Frhst., of Hungary, but the white band-like space is never as wide as in the latter and, what is very distinctive, never shows any traces of fulvous scaling.

Hipparchia briseis, L., race *INTERJECTA*, mihi. In the N.-W. of France there exists a race which, by its underside, darkened in the male by blackish shadings and in the female by a grey suffusion, unmistakably belongs to the northern group of races, but which constitutes a transition to the southern group by its wider band-like space on upperside. It had been noticed by Oberthür, who also observes that it is identical with the race of the higher altitudes in the Abruzzi. I can confirm this by the comparison of a series from the Charente with one from the Sibillini Mts., 1200m. In localities less elevated the race *deminuta*, Frhst., belonging to the southern group, represents the species in Central Italy.

(To be concluded.)

NOTES ON COLLECTING, Etc.

REFERENCES FOR LOCALITIES.—DORSET AND DORCHESTER.—*Ent. Mo. Mag.* i., 121; xxxi., 126 (spring); *Ent.* xix., 118; xxii., 282 (chalk); xxxiii., 101, 246; xxv., 196 (sugar); xxxv., 288; xxxvi., 20 (sugar, ivy); xxxvi., 45, 167.

LULWORTH.—*Ent.* xx., 183, 267.

LYME REGIS.—*Ent.* xxvi., 302; xxxii., 74.

SWANAGE.—*Ent. Record* iii., 207, 209; *Ent. Mo. Mag.* xxix., 191; *Ent.* xxv., 313; xxx., 111, 272; xxxii., 260.

WEYMOUTH.—*Ent. Record* v., 228.

PORTLAND.—*Ent. Record* i., 129; 161; vii., 112; ix., 19; x., 51, 89; xxi., 56; *Ent.* xxii., 43, 57, 116; xxxi., 292.

WIMBORNE.—*Ent. Record* xxi., 126.

REIGATE.—*Ent. Record* xi., 26 (September); xxiii., 290; xxiv., 213; *Proc. S. Lond. E. Society*, 1894, 86; 1902, 43; 1905, 47; 1911, 40; *Ent.* xxxi., 173 (June); xxxviii., 64 (light).

HORLEY.—*Ent. Record* xxvi., 7, 45, 230.

PARASITES.—Lieut. L. Box, 80, Northampton Road, Croydon, is endeavouring to work out the classification and economy of the British *Chalcididae*. As probably the only way to do this is by breeding specimens from their hosts, and it is quite impossible for one individual to deal with all orders of hosts, he would be very grateful for any assistance that breeders of Lepidoptera, Coleoptera, Hemiptera, and in fact of any order, can give him by sending specimens accidentally bred to the above address, with a note as to host, time of emergence, as well as localities where hosts were found, if possible. The nomenclature of this section of the Hymenoptera is in such a chaotic state that the identification of specimens is often a lengthy problem.

PAPILIO MACHAON IN SURREY.—It may be of interest to your readers to know that I have obtained two healthy (wild) larvæ of *Papilio machaon* from Buckland Village (near Reigate). Miss Lizzie Knight, a mistress of Buckland school, spoke to me of a beautiful caterpillar found by one of the boys: I was told that this specimen had died, but there was another, which at my request was kindly presented to me by Miss Knight on the 1st inst., and proved to be a nearly full grown larva of *P. machaon*. It was in a somewhat starved condition but uninjured, and soon recovered on being given its proper food. On the following day (2nd July) I went to the school and interviewed Mrs. Coulson, the courteous Head Mistress, who very kindly allowed the intelligent finders of the larvae, Masters Holman and Claydon, to accompany me and point out where they found their prizes. One was found on a small plot of carrots in Mr. Holman Senior's garden, just behind the school: the other two came from Mr. Claydon Senior's farm, where there is a large plantation of carrots. One specimen was the dead one previously alluded to, the other is one I found on the carrots after an hour's careful search; it is a smaller one in its last moult. I showed the larger specimen to Dr. Chapman, F.R.S., who pronounced it to be *P. machaon* without a doubt. The farm, by the way, is only $\frac{1}{4}$ mile distant from the garden.—HENRY SPEYER, "Highbury," Reigate, Surrey.

[I have now identified the insects referred to before. The "black Orthopteron" is *Gryllus campestris* (p. 112, l. 36), the "Bumble-bee" is *Bombus terrestris* (p. 113, l. 8), the "good-sized bee" is *B. agrorum* (p. 113, l. 10), and the "grey-brown bee" is *Anthophora dispar* (p. 113, l. 10).—E.B.A.].

NOTES ON ENTOMOLOGY IN FRANCE AND ITALY IN 1918.—After some days almost incessant rain I left Arquata on April 30th, and spent the night at Milan, en route for Vicenza. In the morning of May 1st I visited the public gardens in Milan, which are beautifully

laid out with many interesting shrubs and plants, and well worth a longer visit.

In these gardens is situated the "Museo Civico di Storia Naturale," a museum with a splendid collection of birds, and generally to be found open. The collection of butterflies was not to be seen at this date, but I was told that it could be seen from October 1st.

In the evening of May 2nd I walked up Monte Berico at Vicenza. *P. brassicae*, *G. rhamni*, and *Pararge megera* were flying. In the long arcade leading up to the Church of Madonna del Monte there, I met with a fine specimen of the glow-worm. The vegetation here I found to be more advanced than at Arquata, and on a fine cluster of wisteria at the top of Monte Berico, the *Xylocopa* bee was swarming.

The following day, in the afternoon, I was again on the slopes of Monte Berico, which get the afternoon sun, the further side from Vicenza, when *P. megera* and *M. didyma* were fresh and abundant, with specimens of *Glaucopsyche cyllarus*, *Agriades thetis*, *P. rapae*, *Vanessa io*, and *Melitaea cinxia*. *Rumiccia phlaeas*, *Celastrina argiolus*, *G. rhamni*, and *P. napi* were about with several *Leptosia sinapis* and a *Euchloë cardamines*. Even in early evening the air was very hot. The locality appears a promising one.

On May 4th I was again on the sun-burnt slopes of Monte Berico in the late afternoon (4 o'clock, the insects' time). *Papilio machaon*, *Issoria lathonia*, and *C. rubi* with several *Polyommatus icarus*. *R. phlaeas*, *Melitaea didyma* (both sexes), *P. megera*, and *Coenonympha pamphilus* were in number, some of the last species being unusually large. *Hesperia malvae* and *N. tages* were still quite fresh. I did not secure the only *C. edusa* I saw. There were also hornets about. *Sesia stellatarum* was numerous, all probably hibernated and therefore worn, but on my way back across the top of the hill I took one specimen in good condition. Among the moths I took were *Xanthorhoe fluctuata*, *Strenia clathrata*, and both sexes of *Ematarga atomaria*. To-day Dragonflies were seen on the wing.

On May 10th it was thundery, but after tea I made my way again to Monte Berico, when I found both *Melitaea athalia* and *M. didyma* at rest on the flowers. *Polygonia c-album* were quite fresh, and *Agriades thetis* (*bellargus*) including several females were taken. A single female *Glaucopsyche cyllarus* with *P. icarus*, *Aricia medon* (*astrarche*), two males, a male *Agriades sylvanus*, and one *Zygaena lonicerae* made up the evening's capture.

On May 13th I was out somewhat earlier. The sun was blazing, the heat penetrating even one's boots. *Aporia crataegi* was out this day in the gardens on the hill in some number, and on the rocky ground towards the bottom of the slope I was pleased to capture two *Scolitantides orion* in superb condition. *Melitaea athalia* was now abundant and *Euclidia mi* was noted. *Zygaena lonicerae* was coming out well, and the females of *A. thetis* were now frequent, as were the females of *Colias hyale*. I took a freshly emerged *Aglais urticae*, a female of *Loweia dorilis*, and one *Hesperia alveus*, while *Camptogramma bilineata* was noted.

The sun did not shine on May 15th, but in a walk on Monte Berico I found a specimen of *Polyommatus amanda* quite fresh on a flower head, with numbers of *Z. lonicerae*. A pretty green grasshopper was noticeable on the green vegetation all along the roadside, and the

"blood-vein," *Timandra amata*, which rose on the hillside as I went along, were quickly appropriated.

May 16.—Although the sun was often beclouded, the heat even on Monte Berico was terrific. The females of *A. crataegi* were now out, but not numerous, while the males were flying everywhere in the gardens on the mountain slope, some of them being of very large size. In the grassy pastures bordering the woods *M. athalia* females were numerous and *C. rubi* could still be found quite fresh. The males of *M. didyma* were now going over. *Angiades sylvanus* was now abundant in both sexes. The very numerous females of *A. thetis* were strongly marked with blue. I captured a specimen of the moth *Thalera fimbrialis* (*thymiaria*), and near the wooded parts met with several *Acontia luctuosa*. I took two specimens of a "blue" which I think are *Cupido sebrus*, but they are rather different from the forms of this species I have usually met with at Digne. *Diaphora mendica* was taken on the way down, and in the arcade mentioned before I found a young larva of *Cossus ligniperda*.

On May 17th I was late reaching the ground and flight was almost over for the day, and there was a slight breeze. I saw a male *Glaucopsyche melanops*, and took a couple of nice *P. amanda*. *Aricia medon* (*astrarche*) was out, and *A. sylvanus* was still plentiful. The first *Adopaea flava* (*thaumas*) put in an appearance and I again searched for blue females of *A. thetis* with good success. While leaving the ground I took the first *Coenonympha arcania* I have seen here, a very large form.

May 18th was a favourable day for collecting on Monte Berico, and I took advantage of it by getting on the ground earlier than on previous occasions. Males of *Colias hyale* were numerous. Two more *S. orion* were taken at the same spot as before, and several *A. medon* which had just emerged. Just where the road turns going down towards the large farmhouse, I saw a male *Limenitis camilla*, but failed to secure it. Hay-cutting had begun in the bottoms and on the lower slopes, but probably plenty of ground will remain untouched for collecting. There were plenty of day-flying moths about, and I added *Zygaena carniolica* and *Cosymbia pendularia* to my list of captures. The Italian acacia is now very beautiful with its white masses of flower. Just before leaving I took a freshly emerged *Papilio machaon* sitting on the blossom of a vetch which grows in quantity in the gardens on the top, through which runs a wide path. Along this I found the green-winged orchid, *Orchis morio*, bearing however white flowers.

This morning the Postmaster of Vicenza, who is interested in Natural History, brought me a specimen of *Saturnia pyri* caught in the town. I took *Mamestra oleracea* in the fierce sunlight on the slope of Monte Berico to-day, and several *Z. carniolica*. *S. orion* is more numerous, but requires careful selection to get perfect examples. A single *L. camilla* turned up again to-day as also did a male *G. cyllarus*. Two more *C. sebrus* were taken, and fresh males of *Epinephele jurtina* and *A. urticae*. Both *C. edusa* and *C. hyale* were in increasing numbers, but much too wild to capture. Of *Hesperia sao* my first specimen occurred to-day.

May 21st.—At the bottom of the valley by 5 o'clock insect life was nearly at rest after the torrid heat of the blazing sun, and it was

comparatively easy to pick up what one wanted. *C. edusa*, as though tired with their day's flight, were sitting lazily on the blossoms of *Trifolium*. *Issoria lathonia* was quite fresh, *C. arcania* was out in increasing numbers, another *G. cyllarus* was taken at rest hanging head downwards from the flower. I was too late for *S. orion* to-day, it only seems to be visible in the hottest hours of the day, and *H. malvae*, *A. medon*, and *C. sebrus* were still to be obtained. *G. cyllarus* has never been common here, and I have only seen one or two specimens of *G. melanops*, whereas *A. thetis* and *P. icarus* are abundant everywhere.

May 22nd.—This afternoon I met with a number of large patches of thyme to the right of the road leading to the farm to which insects were crowding. Conspicuous by their number were quite a swarm of *Z. carnioleae*, and among them specimens of *C. arcania*, *L. camilla*, *S. orion*, *P. amandus*, and *C. sebrus*, with the moth *Rhodostrophia vibicaria*.

May 23rd.—This afternoon I visited the Museo Civico. It is one of Palladio's finest edifices, and was restored in 1855. It is very rich in Roman Antiquities and Mediæval Pictures. The natural history collection contains valuable fossils (fish, crocodile, palm, etc.), most of them found near Vicenza, a good representative collection of stuffed specimens of birds found in Italy, a small collection of Coleoptera, and one of moths, showing most of the more interesting species found in Italy, but not kept up to date. Fortunately I found the Director, Signor Luigi Ongaro, at home, and he very kindly showed me round. It is well worth a visit.

May 24th.—This afternoon was very sultry, and I did not get on to the ground until just after four o'clock. *G. cyllarus* is still very scarce and I only got three females to-day. I was glad to get several more fresh examples of *G. melanops* and a couple of *P. amandus*, which is still pretty scarce. The spring brood of *M. didyma* is now practically over. It was again too late and too windy for *S. orion* in the only spot on the Monte Berico where it occurs, in a length of about 20 yards of rocky bank overgrown with vetch. Males of *Epinephele jurtina* were plentiful, and I took the moths *Coscinia striata* and *Procris statice* both quite fresh.

On May 27th I again left for Arquata, reaching Verona in time for breakfast, after which I spent several hours in seeing the beautiful Churches and Public Buildings and the old Roman Arena. The Museo Civico is housed in the charming Palazzo Savezzola Pompei, erected about 1530. There is a Natural History collection which includes among other things two collections each of Lepidoptera and Coleoptera. These, however, have suffered severely by continued exposure to light. The best collection of Lepidoptera was the local one made by Sig. Inq. Orseolo Massalonga, which contains over a hundred different species of Butterflies. Fortunately I met Sig. Vittorio dal Nero, the head of the N.H. Department, and he kindly showed me his private collection of local Lepidoptera, in which I noted a fine series of *Thais polyxena* var. *cassandra*, taken in the mountains just north of Verona, where it flies in March.

The "glorious" 1st of June broke fine and saw me again crossing the little wooden bridge across the river Scrivia on my way to the gorge on the right. Here in the late afternoon of a breezy day I found many *Lycaenidae* in their last flight before settling down, conspicuous

among them being plenty of *A. coridon*, with a few *P. amanda* and *Plebeius aegon* in good condition, one *S. orion*, one *Loweia alciphron*, several *Zygaena pilosellae* in excellent freshness, and numerous beetles, including *Cetonia aurata*. I also found specimens of *Aretia villica* and *Melanargia galathea* var. *procida* with several more *G. cyllarus* and *G. melanops*. An aberration of *A. coridon* I took has two black lines on the upper hindwings. The following moths I got last evening at the electric light, *Pharetra auricoma*, *Lithosia deplana*, *Mamestra oleracea*, and *Thamnonoma rauraria*.

June 3rd.—Last night at light I took *Apamea nebulosa* and *Calophasia lunula* (*linariae*)—(to be continued).—E. B. ASHBY (Lieut., F.E.S.). 1919.

CURRENT NOTES AND SHORT NOTICES.

With the advent of March the Entomological Society of Brussels recommenced the issue of its *Bulletin* and *Annales*. M. August Lameere is President and M. H. Schouteden is Hon. Secretary. Three numbers of the *Bulletin* and *Annales* have already appeared. Among other matters these contain (1) The Construction of the Raft for the Ova of the *Hydrophilus* (Col.), (2) Notes on the Coleopterous Fauna of Belgium, (3) The Aquatic Hemiptera of Belgium, (4) Notes on the Field Cricket, (5) A Study of the *Psychodidae* (Dip.) of Belgium, (6) Descriptions of a large number of new species of *Buprestidae* (Col.), etc. We welcome the appearance of this publication.

Part v. of the *Trans. Ent. Soc. London* for 1918, concluding the volume, has just been issued. In spite of a few losses by death and resignation the membership, we are told in the annual report, has gone up to over 600, and the income of the Society has increased by considerably over £200, although from various circumstances only 455 Fellows paid their subscription within the financial year. One good feature we note, and that is that the accounts are now examined and certified correct by a chartered accountant. A new feature is the inclusion of a list of the Donors to the Society.

The *Smithsonian Institute* have sent the following publications as separata:—(1) New Ptinid Beetles, mostly reared during the investigation of attacks on forest trees. (2) Hemiptera from Dominica, collected by the Yale Expedition, 1918. (3) New species of Chalcid-flies. (4) Additions and Corrections to the previously published paper on Gall-wasps of the *Cynipoidea*. (5) New reared species of Parasitic Hymenoptera; and (6) by Prof Cockerell, the third portion of his long memoir on the Bees in the U.S. National Museum. In this he deals with the genera *Melipona*, *Trigona*, *Xylocopa*, *Ceratina*, *Coelioxys*, *Centris*, *Megachile*, etc.

In the *Bull. Soc. ent. Fr.* for March is an article by the Abbé J. de Joannis, "The *Galleriidae* should form a distinct family from the *Pyralidae*," in which he endeavours at some length to show from numerous points of view, and on various grounds, that the former were derived from the Microlepidopteron stock and only came to resemble the *Pyralidae* by subsequent convergence.

In the *Revue Mens. (Namur)* for April, Baron Crombrugge writes a note on the occurrence commonly around Brussels of *Pyrausta nubilalis*, where it had hitherto been considered to be as rare as in this

country. He found that the food plant of the larva was *Artemisia campestris*, and not any of the food plants usually given by authors for this species. He gives details of the life-history and criticises previous authors whose remarks do not agree with his observations. For instance the larva hibernates, but not in the adult stage, which it only reaches in June, being in April only two-thirds full-grown. M. Ch. Cabeaux describes two further aberrations of *Apatura iris*. (1) *ab. dimeres* is really *ab. afflicta* in which the outer half of the upperside of the hindwings is of an almost uniform yellowish-brown, the forewing above with six little whitish or greyish spots and, except the second, only slightly visible, on the undersides the white spots of *iris* are represented but, by little, or very little, whitish or greyish markings. (2) *ab. cerberaea*. The underside of hindwing is that of *iole*, but that of the forewing has six little whitish or greyish spots hardly visible. The median band of the hindwings above is absent, its space being covered by the red-brown of its two edges. The submarginal round spot, usually black and ocellated, is transformed into a whitish elliptical spot. M. L.-J. L. Lambillion describes a new aberration of *Lomaspilis marginata* as *ab. andrearia*. Entirely of a slightly yellowish-white, except two black marks along the costa, the one at the base and the other in the middle, a short distance from the first, and on the outer margin of all the wings a thin black line, without the least toothing. The disc of all the wings is completely destitute of black dots.

The *Irish Nat.* for May contains an interesting memoir on the Lepidoptera collected by the late Lieut. R. E. Cusack by J. N. Halbert. Among the records are a yellow form of *Pieris napi*, near Bray, and a primrose coloured female with nervures and spots of a uniform pale grey; *Colias edusa* at Bray; many forms of *Melitaea aurinia* from Kilmancanogue, in the Bray district. A pale form of *Rumicia phlaeas* and an aberration with the marginal spots on forewings almost obsolete. *Polyommatus icarus* *ab. icarinus*; *Celastrina argiolus* from the Dargle and Powerscourt. *Cupido minima* from the Bray Head cliffs. Larvæ of *Nisoniades tages* from Merlin Park in county Galway. *Eumorphia elpenor*, *Theretra porcellus*, and *Sesia stellatarum* are the only *Sphingidae*. The capture of two *Hadena protea* at Bray head is the confirmation of an old and doubtful record. *Plusia interrogationis* is also similarly a definite record. Of *Hibernia leucophearia* a specimen is recorded. The late de Vismes Kane listed this species as doubtful. A large number of *Tortrices* and *Tineae* are also included. One regrets the loss of so promising and active a student, most of whose work was done in the years 1913 and 1914, while at Trinity College, Dublin, although he had collected while at school.

In the May number of the *Naturalist* H. H. Corbett gives an account of the Aculeate Hymenoptera found in a Doncaster sand-pit, and includes several species not already recorded from the county. A. Dallman gives notes on the gall-makers (*Zooecidia*) of S. Denbigh, Hymenoptera, Diptera, Homoptera, and Acarina. Chas. Couldwell records a curious teratological specimen of *Zygaena lonicerae* with four antennæ; it was bred from a cocoon taken at Flamborough Head. Mr. Couldwell also records a larva (preserved) of *Hipocrita jacobaeae* in which two of the black bands cross one another.

To the May and June numbers of the *Ent.* W. G. Sheldon contributed a long detailed discussion of the variation of *Sarothrips*

revayana, with a plate of 21 figures. In working out the forms the following is a list of those which are newly described ab. *atrata*, ab. *cladodes*, ab. *sagittata*, ab. *obsoleta*, ab. *notata*, ab. *nigripunctata*, ab. *rufescens*, ab. *brunnescens*, ab. *variegata*, ab. *adusta*, ab. *canescens*, ab. *lichenodes*, ab. *fasciata*, ab. *depicta*, ab. *albinaculata*, ab. *plumbea*, ab. *melanosticta*, ab. *nigricans*, and ab. *rosea*, all of which are figured.

In the *Ent. Mo. Mag.* for May F. C. Woodforde describes a new aberration of *Cosymbia* (*Ephyra*) *pendularia* as ab. *orbiculoides*. Ground colour dark grey, first and second line indicated by rather larger dots, the second bordered by a narrow whitish band, faint on inner side. Ocelli are very conspicuous. A narrow reddish band crosses the centre of the wing. The cilia are whitish. F. W. Edwards describes a new Dipteron, *Leptosyna setipennis* from Letchworth, belonging to the *Heteropezinae*.

The *Ent. News* for May contains further descriptions of new species of the genus *Coleophora*, by Annette F. Brunn. *C. polemoniella*, larvæ on pigweed leaves (*Amaranthus hybridus*), Cincinnati, Ohio, etc.; *C. ericoides*, larvæ mining seeds, etc., of wild white aster (*Aster ericoides*), Cincinnati, Ohio, etc.; *C. amaranthella*, larvæ in seeds of pigweed, same localities, and *C. granifera*, larvæ on leaves of *Aster shortii*, same localities. W. Marchand contributes a most useful practical article on "Collecting the Larvæ of *Tabanus* and *Chrysops* (Dip.)," with notes on the life-histories with a view to the study and breeding of the species.

The *Can. Ent.* for May contains "Fragments in the Life-histories of Manitoba Insects," by N. Criddle, an interesting account of real field-work in all orders in the Dominion, which it would be well to continue. The remaining articles deal mainly with insects of various orders of economic importance, a new Coccid on the Cocoanut Palm, new Braconidæ, Coccid notes, spiders from Canada and the northern States, etc.

In the *Ent. Mo. Mag.* for June J. W. Allen announces *Epuræa distincta* as a new beetle to Britain, beaten out of fungus growing on a tree in Glamorgan, possibly, it is suggested, introduced in driftwood. The Rev. F. D. Morice confirms the inclusion of the *Tenthredella flavicornis* in the British List by identification of specimens sent to him from Lichfield.

"Observations on the Life-history of *Lycaena alcon*" is the title of a reprint from *Ét. Lep. comp.* containing the details of the final completion of the solution to the mystery concerning the life-history of this Lycaenid, unveiled by the patient assiduity of our much valued colleague Dr. T. A. Chapman, F.R.S. Larvæ sent by Harold Powell, on September 9th, 1917, in their third instar, were introduced into a nest of the ant *Myrmica scabrinodis*, and diligently watched day by day, almost hour by hour, and their idiosyncrasies noted until the final reward came on August 2nd, 1918, with the triumphant record, "a *Lycaena alcon* arrived this morning." There are seven plates of detail figures, and we believe that in the original there is a coloured plate of the larva. The doctor must be congratulated on his success in adding another to his already long list of discoveries of the complicated symbiotic relations existing between various specific forms in different families and orders.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

February 27th.—FORCING OF *C. PENDULARIA*.—Mr. Newiman exhibited a series of *Cosymbia pendularia* var. *decoraria* (*subroseata*), bred from ova. They were forced to emerge in January, and were all finely developed large specimens.

A BLACK ABERRATION OF *H. LEUCOPHAEARIA*.—Mr. Bowman, a black form of *Hibernia leucophaearia* with conspicuously white fringes, taken in Epping Forest in 1909.

VARIATION SHOWN IN *C. BILINEATA*.—THE RARE *P. CHLORIDICE* AND ITS ALLIES.—Mr. Turner, a series of *Camptogramma bilineata* var. *testaceolata* from Cyprus, and called attention to the various forms (seven) so far named with the range of possible variation. He also showed a short series of the rare and local *Pontia chloridice* from Cyprus, with its close allies *P. daplidice* (generally distributed) and *P. callidice* (alpine).

LANTERN SLIDES.—A large number of Lantern Slides were then shown.

Mr. W. J. Lucas, New Forest scenery, species of *Ascalaphus*, portraits of well-known nature lovers, plants and fungi.

Mr. Bunnett, details of plant life, points in the life-history of various insects.

Mr. A. E. Tonge, ova of Lepidoptera.

Mr. Dennis, the inflorescence of various grasses and sedges.

March 13th.—DECEASE OF A MEMBER.—The decease of Mr. A. K. Ing was announced.

A RARE BOOK.—Mr. Ashdown exhibited a very rare book, Borelli's *De Motu Animalium*, 1685, with curious plates showing the mechanical principles involved in the flight of birds, the foundation of modern aviation.

OCCURRENCE OF *S. BOLETI*.—Mr. R. Adkin, *Scardia boleti*, generally regarded as rare, taken last June in the New Forest.

VARIOUS HETEROCERA FROM THE CONTINENT.—Capt. B. S. Curwen, *Coscinia striata* and ab. *melanoptera* and *C. cribrum* and ab. *candida* from Switzerland, *Utetheisa pulchella* from Gibraltar, *Parasemia plantaginis* with ab. *hospita* and *Orodemias quenselii* from Zermatt.

A PALE *P. NAPI*.—Mr. Sperring, *Pieris napi* with an unusually pale underside of hindwings for a British specimen.

M. PHERUSA AND AB. PLESURA; PALESTINE BUTTERFLIES SHOWN.—Mr. H. J. Turner, a series of the local *Melanargia pherusa* and its ab. *plesaura* from Palermo, Sicily, with *M. syllius* from Hyères for comparison; also a few butterflies from Palestine, sent by Mr. H. W. Andrews, including *Anthocharis belemia*, *Teracolus fausta*, *Zizera galba*, *Chrysophanus thersamon*, etc.

OPSIPHANES.—Mr. Edwards, various species of the genus *Opsiphanes* and its allies from S. America.

A DISCUSSION.—A short discussion on the season and on the occurrence of *Cetonia aurata* and *Aromia moschata* in the London suburbs.

March 27th.—VARIATION IN *L. HIRTARIA*.—Mr. Buckstone, *Lycia hirtaria* bred by the late Mr. T. H. Archer, many males of deep black but slightly relieved by yellow markings.

CONTINENTAL LEPIDOPTERA.—Mr. H. J. Turner, (1) a long series of *Zygaena rhadamanthus* from Hyères, with ab. *cingulata*; (2) a series of *Abraxas pantaria*, a species formerly held as British, closely resembling *A. sylvata*.

MYCETOZOA.—Mr. H. Main, the Mycetoza, *Badhamia utricularis* on decaying sticks from Epping Forest.

MELANIC LEPIDOPTERA.—Mr. Ashdown exhibited very dark specimens of *Drepana binaria* and *Taeniocampa instabilis* just bred from Surrey larvae.

MELANIC H. DEFOLIARIA.—Mr. Bowman, a melanic *Hibernia defoliaria* with pure white cilia from Epping Forest.

LIBYAN ORTHOPTERA.—Mr. Moore, *Pyrrhocoris aegypticus* (Hem.), a *Truxalis*, a *Mantis*, and other Orthoptera from the Libyan Desert.

ABERRATION OF H. FUCIFORMIS.—Mr. Barnett, a bred *Hemaris fuciformis* from Horsley, with very narrow wings and aberrant markings.

A GYNANDROMORPH.—Mr. Tatchell, a *Pyrameis atalanta* with a discal blue patch, and a gynandromorph *Polyommatus icarus*.

HYMENOPTERA.—Lieut. L. A. Box, various Hymenoptera and their associates, prey, etc., with notes on their habits, including *Cerceris arenaria*, *Vespa norvegica*, *Crabro capitosus*, *Mellinus arvensis*, *Syntomaspis cyanea*, etc.

EXOTIC LEPIDOPTERA.—Mr. Edwards, S. American *Nymphalidae*, including *Clothila insignis*, etc.

MELANIC H. PROGEMMARIA.—Mr. Tonge, a coal black female of *Hibernia progemmaria* var. *fusca*.

April 10th.—A RARE BOOK.—Mr. Ashdown exhibited a copy of Panzer's *Symbolae Entomologiae* (quarto 1802) with some fine plates of the Lamellicornia (Col.).

EXHIBITION AND DISCUSSION OF ACIDALIA MARGINEPUNCTATA.—The remaining exhibits were specimens and series of *Acidalia marginepunctata* by Messrs. R. Adkin, Buckstone, Tonge, Ashdown, Mera, Bowman, and B. Adkin, in illustration of the paper on this read by Mr. R. Adkin. In the ensuing discussion the consensus of opinion was that the species was a coast insect and found, as a rule, only very sparingly inland.

SEASONAL NOTES.—Reports of the season were made by several members. Most species were late in appearance, although a few were quite up to their usual date. *Celastrina argiolus* had been seen, *Brephos parthenias* and *Gonepteryx rhamni* had been abundant locally. Vegetation was generally backward.

April 24th.—X. CONSPICILLARIS.—Mr. Newman, a living female *Xylomyges conspicillaris* from Worcester, and a *Cassida viridis* (Col.) found on a thistle recently.

EXOTIC LEPIDOPTERA.—Mr. Bunnett, a *Papilio demoleus* from S. Africa and a *Catagramma* sp. Mr. Edwards, *Papilio cenea* (merope) from S. Africa and several forms of the female.

BIOLOGICAL NOTE ON T. BISTORTATA.—Mr. Buckstone reported that at Horsley he had met with a number of females of *Tephrosia bistortata* with ovipositors extended in crevices of bark in almost dying condition on a morning after an usually cold night.

THE SEASON.—Remarks were made on the lateness of the season and the general scarcity of larvæ this spring so far.

A RARE BOOK.—Mr. Ashdown exhibited Dandin's *Des Rainettes, &c.* (Frogs and Toads), published in the year XI. of the French Republican Calendar (A.D. 1802) with many fine plates.

May 8th.—ANNUAL EXHIBITION OF "OTHER ORDERS."—NEW MEMBER.—Mr. F. H. Wolley Dod, F.E.S., of Alberta, was elected a member.

HYMENOPTERA.—Mr. Frisby exhibited (1) *Vespa dorylloides*, an Eastern species nocturnal in flight, and (2) *Polyrhachis striata*, an ant armed with spines, from India.

PATTERN AND VENATION IN DIPTERA.—Mr. Ashdown, a large number of Diptera set to show the wing-markings and pointed out that the pattern frequently showed no connection with the lines of the venation. He also showed *Cassida nobilis* from Oxshott.

GERARDE'S HERBAL EXHIBITED. Mr. R. Adkin, an original edition of *The Herbal or General History of Plants*, by John Gerarde, 1797.

SAWFLY LIFE-HISTORIES.—Dr. Chapman, living bred specimens of (1) the Solomon Seal Sawfly, *Phymatocera aterrima*, and (2) the Apple-boring Sawfly, *Hoplocampa testudinea*; the former gnaws its cocoon to escape, the latter cuts off a lid.

A CHELIFER.—Mr. Dods, the "false scorpion," *Chelifer cancellarius*, found among books in a warehouse.

NEW FOREST INSECTS.—Mr. South, various species of Coleoptera, Neuroptera, Odonata, Hymenoptera, and Diptera, taken by him in the New Forest during 1914-18 in June.

EXOTIC INSECTS.—Mr. S. Edwards, numerous large species of Exotic Coleoptera, Orthoptera, Bees, and Pseudo-scorpions.

PARASITIC HYMENOPTERA.—Mr. L. A. Box, several species of Hymenoptera, including a specimen of *Rhyssia persuasoria*, the largest British Ichneumon, from Surrey.

EXOTIC CENTIPEDES.—Mr. H. Moore, several species of Exotic Centipedes from Burmah and *Polydesmus cingulata* taken in Sicily by the late Mr. J. Platt Barrett.

SCOLYTUS RAVAGES.—Mr. B. Adkin, oak branches showing the ravages of the beetle *Scolytus intricatus*.

AN EARLY APPEARANCE.—Mr. Leeds, *Aeschna cyanea*, taken at Letchworth on April 27th, 1919.

HEMIPTERA AND HYMENOPTERA.—Mr. West, four drawers of Hemiptera, and also the Hymenoptera *Osmia xanthomelas*, from Darenth, *Andrena fulva* from Box Hill, *Eucera longicornis* from Byfleet, and several *Chrysididae*.

EXOTIC PHASMIDS.—Mr. Turner, some Exotic Phasmids and Mantids.

PHOTOGRAPHIC ENLARGEMENTS.—Mr. Kusner, some remarkable enlargements of slides of Diatoms, *Synapta*, showing the effect of dark and light ground.

HYMENOPTERA.—Mr. Bunnett, a Queen Bee, with workers for comparison. Mr. Tonge, the predaceous Dipterous *Asilus crabroniformis* from Cornwall, and the bee *Anthrophora acervorum* from Deal.

H. ASPERSA AND ALBINO FORM.—Mr. Friske, a varied series of *Helix aspersa*, with the rare white form *exalbida*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.

February 17th.—PAPER.—Mr. H. M. Hallett, F.E.S., read a paper entitled "Wayside Hymenoptera." The paper described one of the author's favourite banks in Glamorgan, where in a short length of some thirty yards he had taken upwards of 150 species of Hymenoptera. The rarer species and their habits were noticed in some detail, the whole formed a most interesting account of the intensive study of the fauna of a limited area.

PAPER.—Dr. John Cotton followed with a short paper, illustrated by a series of lantern slides, on the nest-building of the Hymenopterous genus *Odynerus*; the growth of the nest from the first cell to the completion of the full series, and of the embryo from the ovum to the nymph were shown; slides representing the imago at work, the larvæ with which the cells were stored by the parent wasp as food for its young, instances of parasitism, etc., combined to make a highly instructive address.

EXHIBITS.—Mr. Leonard West, a water colour drawing showing the life-histories of various Trichoptera. By Mr. W. A. Tyerman, *Eugonia erosaria* and *Agriopsis aprilina* from Eastham. By Mr. F. N. Pierce, *Cidaria minna* from Japan and Assam, with *C. ostregiata* for comparison. By Mr. W. Mansbridge, a small selection of aberrations of *Peronea cristana* recently received from Mr. W. G. Sheldon.

March 17th.—PAPER.—Captain A. W. Boyd, M.C., delivered an address on "Collecting in Egypt." When opportunity occurred insects of all orders were collected and sent every few days to Mr. Gilbert Storey, the entomologist attached to the Ministry of Agriculture at Cairo. A very large proportion, some 100 species, about half being Lepidoptera, of Captain Boyd's captures are apparently undescribed, and we may have to wait some time for the complete list. Some of our rare immigrant species are found quite commonly, and Mr. Boyd related how the men were more alarmed by the squeaking of *A. atropos* than by the proximity of venomous reptiles. Photographs of the various places visited contributed to the interest of the address. Mr. Boyd was heartily congratulated upon the amount of work he had accomplished, often under circumstances of great difficulty.

MELANIC P. PEDARIA.—Mr. W. Mansbridge exhibited a bred series of *Phigalia pedaria*, comprising var. *monacharia* and intermediate forms, from Burnley.

April 14th.—REPORT.—Mr. W. Mansbridge reads his report as Recorder of Lepidoptera for 1918. Four species new to Lancashire and Cheshire had been recorded since the last report, viz., *Liparis monacha* and var. *eremita*, *Bryophila muralis*, *Microdia palustrana*, and *Anacamptis albipalpella*.

ASYMMETRICAL *Æ. ICHNEUMONIFORMIS*.—Mr. W. Mansbridge, an asymmetrical ab. of *Aegeria ichneumoniformis* having the left wing tip yellow instead of red.

LITHOCOLLETIS.—He also showed living specimens of *Lithocolletis quercifoliella*, *L. riminiella*, and *L. sorbi*.

SPRING MOTHS.—Mr. S. P. Doudney and Mr. W. A. Tyerman brought series of various spring moths taken in the Liverpool district this year.

Subscriptions for Vol. XXXI. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 [This subscription includes all numbers published from January 15th to December 15th, 1919.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Ten Shillings, and must be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 Cheques and Postal Orders should be made payable to H. E. Page.

During May and early June.—Pupæ: Cinxia, Sibylla, Polychlorus, Villica, 3/- doz.; 20/- per 100. Z. trifolii (Christchurch Warren), 7/- per 100. First 6 vols. of *Entomologists' Record*, well bound.—A. Ford, 36, Irving Road, Bournemouth.

New Cabinets and Apparatus.—Note: Finest make only, and best material only used:

12, 20, 30 and 40 drawer Cabinets in polished deal or mahogany. Specifications and prices on application.

Standard make Store Boxes, 10×8, 5/6; 13×9, 7/-; 14×10, 8/-; 16×11, 9/-; 17½×12, 10/-; postage 6d. extra. Special price by taking 12 or more of one size.

Insect and Egg Cases, Jointed Nets, Pins (Tayler's), Zinc Collecting Boxes, Setting Boards, Killing Tins, etc., etc.

Write for complete lists of set specimens, apparatus, larvæ and pupæ.

LEONARD TACHELL, Lepidopterist, 43, Spratt Hall Road, Wanstead, E. 11.

Desiderata.—*Pieris napi*—spring and summer broods with exact data (localities and dates)—from all parts of the Kingdom, especially North of England and Scotland; *Pararge ægeria* from Scotland, Ireland, and North of England—exact data needed. Will do my best in return or pay cash.—G. T. Bethune-Baker, 19, Clarendon Road, Edgbaston.

Duplicates.—*Varleyata* and other varieties of *Grossulariata*. *Desiderata.*—Good varieties and local forms. *Spilosoma urticae*, *Advenaria*, and other ordinary species to renew old series. Good *Tortricæ* and *Tineæ*.—Geo. T. Porritt, Elm Lea, Dalton, Huddersfield.

Duplicates.—*Grossulariata* var. *lutea*, *lacticolor*, *varleyata*, *fulvaticata*, etc. *Desiderata.*—Other extreme forms of *Grossulariata*, or good vars. of *Diurni*.—Rev. G. H. Raynor, Hazeleigh Rectory, Maldon, Essex.

Desiderata.—*Euchloe cardamines* from Ireland; also types of *E. cardamines* from Switzerland, Italy, S. France; var. *turritus* (S. Italy), var. *volgensis*, var. *thibetana*, and of *E. gruneri*, *F. euphenoides*, *E. damone*, and any paleartic species of the genus. *Duplicates.*—*Loweia dorilis* and vars., a few minor vars. of *R. phlæas* (British), and many British lepidoptera.—Harold B. Williams, 82, Filley Avenue, Stoke Newington, N.

Duplicates.—*A. coridon* vars., including semi-syngrapha, *H. Comma*. *Desiderata.*—*A. coridon* var. *Albicans* (Spanish) and var. *Hispana* (do.), and good butterfly vars., especially from Ireland.—Douglas H. Pearson, Chilwell House, Chilwell, Notts.

Duplicates (all Clydesdale).—*Æthiops*, *Selene*, *Icarus*, *Phlæas*, *Hectus*, *Mundana*, *Perla*, *Fulva*, *Nictitans*, *Tritici*, *Chi*, *Boreata*, *Cambrica*, *Belgiaria*, *Immanata*, *Olivata*, *Tristata*, *Boreata*, *Mercurella*, *Angustea*, *Dubitalis*, *Ambigualis*, *Truncicolella*, *Derepitalis*, *Kuhmella*, *Fusca*, *Margaritellus*, *Hortuellus*, *Hyemana*, *Phryganella*, *Ferrugana*, *Solan-drinana*, *Sponsana*, *Conwayana*, *Stramineana*, *Rivulana*, *Urticana*, *Octomaculana*, *Perlepidana*, *Vaccinana*, *Geminana*, *Herbosana*, *Myllerana*. *Desiderata*—Numerous, especially.—A. A. Dalglish, 7, Keir Street, Glasgow.

Duplicates.—*Janira*, *napi*, *cardamines*, *Artemis*, *P. interrogationis*, *P. festuceæ*, *P. bractea*, *D. conspersa*, *Haslata* (all Irish). *Desiderata.*—*Machaon*, *Artemis* (English), *Cinxia*, *Athalia*, *Cardui*, *Galatea*, *Epiphron*, *Lucina*, *Actæon*, *Sylvanus*, *Comma*. All perfect, well set on black pins.—Charles Langham, Tempo Manor, Co. Fermanagh, Ireland.

CHANGE OF ADDRESS:—H. C. Eglatoun, Shoubrah Avenue, Cairo, Egypt.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m.: 1919; Oct. 1st; Oct. 15th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—Hon. Sec., Stanley Edwards, 15, St. German's Place, Blackheath, S.E. 3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society).—Hall 20, Salisbury House Finsbury Circus, E.C. The First and Third Tuesday in the month, at 7 p.m. Visitors invited. Hon. Sec., J. Ross, 18, Queens Grove Road, Chingford, N.E.

All MS. and editorial matter should be sent and all proofs returned to Hx. J. TURNER, 98, Drakefell Road, New Cross, London, S.E.14

We must earnestly request our correspondents NOT to send us communications IDENTICAL with those they are sending to other magazines.

Lists of DUPLICATES and DESIDERATA should be sent direct to Mr. H. E. Page, Bertrose, Gellatly Road, New Cross, S.E. 14

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

**H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.**

Full List of Ova, Larvæ, and Pupæ, also Lepidoptera, Apparatus, Cabinets etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

G. A. Bentall, F.Z.S.,

NATURALIST.

Carton Store Boxes. $15\frac{1}{2} \times 10\frac{1}{2} \times 2\frac{1}{2}$ "', wood sides, hinged lids, covered dark leather paper, lined white inside, cork bottom. 8s. 9d. each.

Whitewood Double Store Boxes. Lined top and bottom cork Naphthaline cell.

$10 \times 8 \times 3$ "	$14 \times 10 \times 3$ "	$17 \times 12 \times 3$ "
7s. 9d.	9s. 6d.	10s. 9d.

Stained and polished Mahogany colour.

10s. 9d.	12s. 6d.	14s. 9d.
----------	----------	----------

Also stocked in Walnut same price as Whitewood.

Whitewood Travelling Setting Houses. $16 \times 12 \times 4\frac{1}{2}$ "', hinged ends and lid, perforated Zinc both ends. 13s. 6d. each; setting boards extra.

Superior Oval Cork Setting Boards. 14 inches long.

$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4ins.
6d.	7 $\frac{1}{2}$ d.	1s.	1s. 3d.	1s. 4d.	1s. 6d.	2s.	2s. 3d.	2s. 6d.	3s.

40-drawer New Entomological Cabinets, with Mahogany panel doors, £35 each.

Full specification of same can be supplied.

Cork Sheets—

$11\frac{1}{2} \times 8\frac{1}{2} \times \frac{1}{4}$ "	$11\frac{1}{2} \times 3\frac{1}{2} \times \frac{3}{16}$ "	$11\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{4}$ "
2s. 0d. doz. sheets.	3s. 6d. doz. sheets.	4s. 6d. doz. sheets.

Kirby Beard's Entomological Pins—

Size	1	3	5	8	10
White	1s. 3d.	1s. 3d.	2s. 0d.	2s. 9d.	3s. 9d. per oz.
Black	2s. 6d.	2s. 6d.	3s. 3d.	3s. 9d.	5s. 0d. do. do.

Strong Glass Killing Jars, fitted with cork, 2s. each; larger size, 2s. 6d.

Pine Breeding Cages for low feeding larvæ $16 \times 12 \times 7\frac{1}{2}$ "', with perforated zinc lid. 10. 6d. each.

Round Chipette Boxes, very strong—

$1\frac{1}{2} \times 1\frac{1}{2}$ "	$1\frac{3}{4} \times 1\frac{1}{4}$ "	$2 \times 1\frac{1}{2}$ "
3d. doz.	4d. doz.	5d. doz.

Round White Metal Boxes—

$1\frac{1}{2} \times \frac{3}{4}$ "	$2 \times \frac{3}{4}$ "	$2\frac{1}{2} \times 1\frac{1}{4}$ "	$3 \times 2\frac{1}{4}$ "
6d. doz.	7 $\frac{1}{2}$ d. doz.	8d. doz.	1s. 9d. doz.

Strong Canvas Bag for Larvæ Collecting, Sallows, etc. 17×30 ". 2s. each.

Pattern of material sent post free.

Folding Brass Adjustable Pocket Net with Screw, to fit any stick. 6s. 9d. each.

Tracing-Paper for Setting Insects. 20×30 ". 3 $\frac{1}{2}$ d. sheet; samples free.

White Tiffany (soft finish) for Sleeveing, etc. 30" wide. 10 $\frac{1}{2}$ d. yard; samples free.

Blue Steel Glass-headed Pins. $1\frac{1}{2}$ " long, for setting with tracing-paper. 6 $\frac{1}{2}$ d. box of 4 doz. pins.

Price Lists, post free, on request.

DUDLEY HOUSE, SOUTHAMPTON ST. (opposite Hotel Cecil),
STRAND, W.C. 2.

The Entomologist's Record

AND

Journal of Variation

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.

GEORGE T. BETHUNE-BAKER,

F.Z.S., F.L.S., F.E.S.

M. BURR, D.SC., F.Z.S., F.L.S., F.E.S.

(REV.) C. R. N. BURROWS, F.E.S.

(REV.) GEORGE WHEELER, M.A., F.E.S.,

and

HENRY J. TURNER, F.E.S.,

Editorial Secretary.

T. A. CHAPMAN, M.D., F.R.S., F.E.S.

JAS. E. COLLIN, F.E.S.

H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

JOHN HARTLEY DURRANT, F.E.S.

ALFRED SICH, F.E.S.

CONTENTS.

	PAGE.
The various Modes of Emergence and the Number of Annual Broods of the Grypocera and of the Rhopalocera, <i>Roger Verity, M.D.</i> (concluded)	141
<i>Brenthis pales</i> , its history and its named forms, <i>Hy. J. Turner, F.E.S.</i> (continued) ..	148
Collecting in several places in 1916-1918, <i>Major P. P. Graves, F.E.S.</i> (concluded)	156
<i>Acala reticulata</i> , Ström. = <i>contaminana</i> , Hb. — its History and its Variation	158
Catalogue of Palaearctic Psychides [<i>Rev. C. R. N. Burrows</i>]	165
SCIENTIFIC NOTES AND OBSERVATIONS.—Variation in <i>D. mendica</i> in Ireland, <i>Thos. Greer</i> ; The term "nymtypical" [<i>H.J.T.</i>]	168
NOTES ON COLLECTING :— <i>Sphinx pinastri</i> in Sussex, <i>E. P. and P. A. Sharp</i> ; Records from Mucking, <i>Rev. C. R. N. Burrows</i> ; Notes on <i>Coleophora vibicella</i> , Hb., <i>A. Sich, F.E.S.</i> ; <i>Agrilus lunatus</i> in Surrey, <i>W. J. Ashdown</i> ; Notes on Entomology in France and Italy in 1918, <i>C. B. Ashby, F.E.S.</i>	168
CURRENT NOTES AND SHORT NOTICES	173
SOCIETIES :—The South London Entomological Society	176
SUPPLEMENT :—The completion is still held over.	

AUGUST-SEPTEMBER 15th, 1919.

Price TWO SHILLINGS (NET).

Subscription for Complete Volume, post free

(Including all DOUBLE NUMBERS, etc.)

TEN SHILLINGS.

TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,

"BERTROSE," GELLATLY ROAD, NEW CROSS, S.E.14.

Communications have been received or have been promised from Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, C. P. Pickett, Parkinson Curtis, H. Donisthorpe, A. Sich, Dr. Verity, C. W. Colthrup, Rev. C. R. N. Burrows, Dr. T. A. Chapman, Capt. Burr, G. T. Bethune-Baker, E. B. Ashby, P. A. H. Muschamp, J. H. Durrant, Orazio Querci, Rev. F. D. Morice, with Reports of Societies and Reviews.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/5, 2/2, 2/6, 3/2. Folding Nets, 3/9, 4/3, 4/9. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 7d., 10d., 1/2, 1/10. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 9d. per four dozen, 1 gross, 2/-. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/7 per tin. Store-Boxes, with camphor cells, 2/3, 2/9, 4/-, 4/6, 5/6, 6/8. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 10/6, 12/9; corked back, 15/9. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/9, 4/6, 5/6, 8/3. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/9 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, 1/2 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/6. Glass-top and Glass-bottomed Boxes, from 1/3 per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in-leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d., 1/-; Blowpipes, 4d., 6d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families and for all insects liable to become greasy.

We stock various sizes and lengths of these Silver Pins which have certain advantages over ordinary entomological pins (whether enamelled black or silver or gilt).

NESTING BOXES of various patterns which should be fixed in gardens or shrubberies by lovers of birds before the breeding season.

SHOW ROOM FOR CABINETS

Of every description for INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS &c.

Catalogue (84 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic),
Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.

Bexley]

L. W. NEWMAN

[Kent

Has for sale a superb stock of 1918 specimens in fine condition, including Varleyata; Bicuspis; Pendularia var. Subroseata; Melanic forms Lariciata, Consortaria, Consonaria, Abietaria; Irish forms Aurinia and Napi, fine vars. Tiliæ, Yellow Dominula, etc., etc. Quotations and Insects sent on approval with pleasure.

Also a huge stock of fine PUPÆ and OVA.

Write for latest price lists.

NOTICE:—Owing to huge rise in cost of metal, etc., my **Relaxing Tins** are now **3/6** small and **5/6** large, post free.

GALLS AND PIERCED BRAMBLE AND BRIER STEMS.—Mr. L. A. BOX would be very grateful for any sorts and quantities, with localities, from all parts of the United Kingdom. **80, Northampton Road, Croydon.**

The various modes of Emergence and the Number of Annual Broods of the Grypocera and of the Rhopalocera of Southern Europe, illustrated by the Tuscan species.

By DR. ROGER VERITY.

(Continued from page 110.)

It will be useful to recapitulate briefly in the following table what we have said up to now :

Causes of error in the determination of the number of broods :
DURATION OF LIFE : long-lived (*vita longa*) and short-lived (*vita brevis*) ;
PERIODS OF PAUSE IN THE EMERGENCE OF THE IMAGINES : winter pause (*quies hiberna*), and summer pause (*quies aestiva*). There may result bipartite broods (*generatio bipertita*), and therefore apparent broods (*generatio simulata*), which may be monosexual. These periods of hibernation and aestivation can be passed at the imago stage ; *imagines hibernantes*, *imagines aestivantes*.

Variations in the modes of emergence :

a. FREQUENCY OF BROODS : ordinary broods (*generatio ordinaria*) and extraordinary broods (*generatio extraordinaria*).

Biennial species (*species bima*), annual, monogoneutic or single-brooded (*annua*), bigenerate, digoneutic or double-brooded (*bigenerata*), trigenerate, trigoneutic or triple-brooded (*trigenerata*).

b. PERIODS OF EMERGENCE : (See following list of Tuscan species). These can be very variable in special cases : migrating broods (*generatio migrans*).

c. DURATION OF THE EMERGENCE : Short emergence (*generatio contracta*), and long emergence (*generatio prolata*) ; in this last one may distinguish a nucleus (*generationis nucleus*), precocious individuals or forwards (*individui praecoces*), and tardy individuals or laggards (*individui tardi*). Graduated emergence (*generatio graduaria*), equally with a nucleus and with precocious families (*familiae praecoces*), and tardy families (*familiae tardae*).

d. NUMBER OF INDIVIDUALS : equal in all the generations (*aeque generatae*), primary brood (*generatio primaria*), secondary brood (*g. secundaria*), and tertiary (*g. tertiaria*). The actual number of individuals and the relations between those of the various broods offer "specific" variations (*varietas specifica*), "geographical" (*geographica*), and "annual" (*annua*). Suppressed brood (*generatio deleta*) ; partial broods (*generatio diminuta*).

e. DISTRIBUTION : Diffused species (*species sparsa*), and localised species (*species coacta*), wherever by specific localisation (*coactio specifica*), or in determinate regions by local causes (*c. geographica*).

f. SEXUAL DIFFERENCES : Male individuals are generally more numerous and more precocious ; females may be more numerous (*polygynogenism*) in a few polygynogoneutic species (*species polygynogenetica*), or they emerge at the same time as the males in a relatively small number of species, which may be called : "with precocious female" (*foemina praecoce species*).

*

*

*

Table of the maximum number of annual broods and of the different types of emergence of the *Grypocera* and of the *Rhopalocera*, which inhabit the plains and the hills of the neighbourhood of Florence and

AUGUST-SEPTEMBER, 1919.

of Northern Tuscany. (The species, whose localities are mentioned, are those which have not been found near Florence.)

[The dates are those of emergence in the plain and lower hills, up to 500m.]

ANNUÆ.

April.—*Anthocharis cardamines*, L.

April 15th to May 15th.—*Thais hypermnestra*, Scop. (= *polyxena*, Schiff.).

May.—*Aporia* (*Pieris*) *crataegi*, L., *Melitaea cinxia*, L., *Hamearis* (*Nemeobius*) *lucina*, L. (from the 10th to the 20th), *Thecla* (*Chatten-denia*) *w-album*, Knoch., *Hesperia sidae*, Esp. (from the 10th to the 20th).

June.—*Brenthis hecate*, Schiff., *B. daphne*, Schiff., *Argynnis cydippe* (*esperis*), Vrtý. (= *adippe*, auctorum nec L.), *Melanargia galathea*, L., *Thecla* (*Nordmannia*) *ilicis*, Esp., *T. (N.) acaciae*, Fabr., *Agriades escheri*, Hüb., *A. amandus*, Schn., *Thymelicus acteon*, Rott., *Adopaea lineola*, Ochs., *A. flava*, Brunn (= *thauumas*, Hufn.), *Erynnis* (*Carcharodus*) *lavateræ*, Esp.

End of May to July 15th.—*Epinephele jurtina*, L.

June 15th to July 15th.—*Satyrus circe*, Fabr., *Loweia alciphron*, Rott.

June to August.—*Satyrus major*, Esp. (= *hermione*, auctorum nec L.).

End of June to July 15th.—*Pyronia ida*, Esp.

July.—*Satyrus neomiris*, God. (*), *Hyponephele lupinus*, Costa, (= *lycaon*, Rott.), *Bithys quercus*, L., *Polyommatus meleager*, Esp., *Lycaena arion*, L.

[(*) Isle of Elba (Mount Capanne).]

July 15th to August 10th.—*Pyronia tithonus*, L.

July to August.—*Limenitis camilla*, L. (= *sibilla*, L.) (+), *Hipparchia semele*, L.

[(+) Pine woods between Pisa and Leghorn (Vione delle Capanne Bruciate, in the Tombolo). The existence of this and another isolated colony in the Mainarde Mts. (province of Caserta), of a species, which does not otherwise extend southward of Turin, is worthy of notice. No author mentions more than one brood in the whole of its extensive habitat, and the dates of emergence are always June and July. Rocci alone says that at Turin it is found on the wing "from the end of the spring to the beginning of autumn, just like *rivularis*," which seems to point to more than one brood in that locality. In the Tombolo, on the 9th of August, 1917, I found both worn and fresh males abundant and one single female, just emerged; this would seem to point to two broods; *rivularis* in the same locality has three broods, the second of which in the later half of July.]

August.—*Hipparchia briseis*, L., *Enodia dryas*, Scop. (†), *Ruralis betulae*, L., *Agriades coridon*, Poda, *Urbicola comma*, L.

[(†) Cernaione Valley (warm springs of the baths of Lucca).]

August 15th to September 10th.—*Satyrus statilius*, Hufn.

ANNUÆ GRADUARÆ.

April to May.—*Callophrys rubi*, L.

April 15th to June 15th.—*Glaucopsyche cyllarus*, Rott.

May to July.—*Dryas pandora*, Schiff. (*)

[(*) Isle of Elba.]

June to August.—*Dryas paphia*, L.

End of May to September (nucleus: September 1st to 15th).—*Lampides boeticus*, L., *Raywardia telicanus*, Lang.

ANNUE ORDINARIE ET BIGENERATÆ EXTRAORDINARIE.

I., May to June; II., September 1st to 15th.—*Euchloë crameri*, Btl. (†).

[(†) The second generation of this species, which is supposed to emerge in June, according to all the writers, and to be constantly distinguishable by special features, is probably but a myth, which ought not to be carried on from one entomological work to another. First of all two successive generations, so close to one another as not to allow the larvæ time to grow up, and not followed subsequently by any other generation, constitute a nonsense; then, the two forms which are supposed to be characteristic of the two broods, often, on the contrary, emerge mixed up together, as I was able to observe particularly on Mount Calvo, above Montenero, near Leghorn, where ♂♂ were abundant on June 9th, 1917, and where ♀♀ of the extreme forms (*romana*, Calb., and *romanoides*, Vrtý.) were beginning to emerge together. On the other hand in a large series collected by the Querci family at S. Martino alle Scale (Palermo) the two forms of the species are quite distinct, one having emerged from April to May 15th, the other from this date till June 15th, in both instances the ♂s being followed by the ♀s, and in the first group the latter only having appeared in the last days of April. Having discarded the possibility of two generations, we are left with a point of interrogation as regards this phenomenon; one might perhaps suggest that one of the forms is the product of the biennial chrysalids observed to exist in *crameri* by various authors. It seems, however, more probable that the two forms are the product of surroundings, and that in some cases a bipartite emergence occurs, when the two lots have a different appearance on account of the seasons.]

I., June 15th to July 15th; II., end of August to beginning of September.—*Melitæa athalia*, Rott.

ANNUE MIGRANTES.

From May to October, during 1 or 2 months in each locality.—*Gegenes lefebvrei*, Ramb.

BIGENERATÆ.

Gen. I. primaria; *Gen. II. fere extraordinaria*.

I., May; II., beginning of August.—*Cupido minimus*, Fuessl., *C. sebrus*, Bsdv.

I., May 15th to June; II., August.—*Cyaniris semiargus*, Rott.

Gen. I., primaria.

I., April to May; II., July 15th to August 10th.—*Hesperia malvoides*, Elw. and Eds.

I., end of May to June; II., August to September 10th.—*Coenonympha corinna*, Hb. (*), *C. arcania*, L., *Apatura ilia*, Schiff.

[(*) Isle of Elba.]

I., end of May to July 15th; II., September to April.—*Polygonia egea*, Cr.

Gen. II., primaria.

I., May; II., August.—*Thersamonia thersamon*, Esp., *Charaxes jasius*, L.

I., May 15th to June; II., August.—*Pararge maera*, L., *Melitaea phoebe*, Kn.

I., end of May to June; II., end of August to beginning of September.—*Agriades hylas*, Esp.

(I., June); II., September 1st to 10th.—*Chrysophanus dispar*, Haw. (†).

[(†) Marshes of the Tuscan coast from the lake of Massaciuccoli to that of Porta. The I. gen. has never been looked for in Tuscany, but certainly exists there.]

I., June 1st to 15th; (II., September?)—*Aglais urticae*, L.

I., end of June to July 15th; II., end of August to October.—*Polygonia c-album*, L., and presumably as regards II. gen., *Vanessa io*, L., *Euvanessa antiopa*, L.

I., end of June to July 15th; II., September to March.—*Eugonia polychloros*, L.

Gen. I., graduaria; Gen. II., diminuta.

I., April 10th to July 15th; II., August 1st to 15th.—*Nisoides tages*, L.

I., April 10 to August; II., August (†).—*Scolitantides baton*, Bgrstr.

[(†) The II. gen., very partial, emerges during August at the same time as the end of the I. gen. and during a month only, whereas the I. emerges during about five months!]

Migrans: Gen. I., graduaria; Gen. II., diminuta.

I., from May to August, during about 2 months in each locality; II., beginning of September (Florence), during about ten days (*).—*Agriades sylvanus*, Esp.

[(*) In 1918 I have collected a II. gen. during the first days of September in the Val d'Ema, near Florence; in the text I have already mentioned the extraordinary brood observed by Querci at Caserta.

BIGENERATAE GRADUARIAE.

Gen. I., primaria.

I., April 15th to end of May; II., end of June to beginning of August.—*Everes alcetas*, Hoff. (= *corëtas*, O.) (†).

[(†) This species emerges in a very graduated way, and tardy individuals emerge respectively even in June and at the end of August; the II. gen. is divided in two lots by the summer pause; Stefanelli mentions "the beginning of autumn;" specimens observed at this season undoubtedly belong to the I. gen., and are autumnal precocious individuals of it rather than a III. brood capable of breeding as late in the year. At Pertusola, near Spezia, I have observed a "short emergence" of abundant individuals from August 15th to 25th, which can easily be explained by the late emergence of the II. gen. of most species in Liguria as compared to Florence.]

I., end of April to June 20th; II., August to September 10th.—*Powellia sao*, Hb.

I., May 15th to June 15th; II., August to September.—*Agriades aragonensis*, Vrtý.

I., May to July; II., August to September.—*Melitaea didyma*, Esp.

I., (October), April to July 15th; II., July to September.—*Coenonympha pamphilus*, L.

I., end of March to end of June; II., end of June to September 15th.—*Agriades thersites* (Cant.), Chap.

Gen. II., primaria.

I., (end of October), April 10th to end of June; II., end of June to September 15th.—*Polyommatus icarus*, Rott.

I., end of April to June 20th; II., August 15th to October 15th.—*Hesperia onopordi*, Ramb.

I., May 15th to June 15th; August to September.—*Agriades thetis*, Rott. (*)

[(*) There is not much difference in the number of individuals of the two broods in certain localities, like Florence, and, when a difference does exist, either one or the other may be the primary one.]

I., May 15th to June; II., August to September.—*Plebeius argus*, L. (*aegon*), *P. idas*, L. (= *argyrognomon*, Bgstr.) (†), *P. ligurica*, Obth. (‡) I., May 15th to June; II., August to end of October.—*Hesperia armoricanus*, Obth.

[(†) I have sometimes found male specimens in small numbers near Florence (Fosso di Gamberaia) at the end of September and in October; they are undoubtedly autumnal precocious individuals of the I. brood.]

[(‡) We have few data as yet concerning this newly-described species. In the plains I have collected it at St. Felice a Ema, near Florence, at the end of May and at the beginning of June, so that I conclude it has two generations similar to those of *P. idas*; I have mentioned it already in the text.]

I., May to July; II., August to September.—*Pyrameis cardui*, L.

I., end of May to June; (II. September to October.)—*Pyrameis atalanta*, L.

NOTE.—Observations on the *Vanessidi*.—The different kinds of *Vanessidi* behave in different ways:—

Pyrameis cardui emerges from the beginning of May till the end of June, and the II. gen. emerges during August and September, the last butterflies dying off in October.

P. atalanta emerges later: from the end of May to July 15th, and the II. brood presumably in September and October; it hibernates at the imago stage, and it is seen flying during the whole winter until the end of March, on suitable days.

Euwanesa antiopa emerges at the end of June and at the beginning of July, the II. gen. presumably emerges in the autumn, but never flies at this season, and only exceptionally during the winter; it appears very often on the wing late in April, and lives till the middle of May. Seitz only attributes one brood both to *polychloros* and to *antiopa*; in the south the former certainly has two; the latter I have never seen in the autumn at any stage, so that it may be the July individuals aestivate and hibernate, although it does not seem probable in a climate such as that of Central Italy; on the other hand I do not recollect having ever found in the autumn a freshly emerged specimen or larva of *atalanta* or *io* either and in consequence I could not affirm that they are annuals, just as they are in the north.

Vanessa io emerges at the end of June and at the beginning of July, and the very scarce specimens of the presumable II. brood found in Florence were met with in March.

The only *Aglais urticae* which have ever been found in Florence were at the

caterpillar stage and consisted of two families, which emerged respectively at the beginning and in the middle of June 1918.

Eugonia polychloros emerges from the end of June to July 15th, and the II. gen. emerges in a very graduated way during the whole winter from September onward, but chiefly in February and in the early half of March.

Polygonia egea emerges in a graduated way from the end of May to the middle of July, and the II. generation consists of two lots, one of which emerges in the autumn from the first days of September onward (these individuals are to be seen in September, but are never on the wing during the winter, and only appear again in March), and the second one emerges in the spring, in March, and as late as April 15th.

P. c-album emerges the later half of June and as late as the beginning of August; the II. gen. emerges from the end of August and, after hibernation, the butterflies fly in February and early March.

TRIGENERATAE.

[Within the comparatively limited times of emergence of each generation these species all tend to the graduated type and may be considered as *graduariae*. *Loweia dorilis*, Hufn., and *Limenitis rivularis*, Scop. (*camilla*), are the only exceptions amongst the species mentioned below. There are, however, notable differences between the various generations, the II. generally being the shortest, and the III. the most graduated.]

Group of species which do not show constant differences in the comparative importance of the three generations (aequegeneratae).

I., (end of October), March 10th to May; II., June; September (nucleus 5th to 10th).—*Pararge megera*, L.

I., April to May; II., beginning of July; III., end of August.—*Iphiclidea* (= *Cosmodesmus*) *podalirius*, L.

I., March 10th to May; II., June; III., September.—*Mancipium* (*Pieris*) *brassicae*, L., *Pieris rapae*, L.

Gen. I., primaria.

I., March 15th to May; II., June; III., August to September.—*Pararge aegeria*, L.

I., end of March to April 15th; II., June; III., August to September.—*Lycaenopsis* (= *Celastrina*) *argiolus*, L.

I., April to May 20th; II., July to August 10th; III., September 1st to 15th.—*Aricia medon*, Hufn.

I., April to May; II., June; III., August to September.—*Leptosia* (*Leptidea*) *sinapis*, L.

I., October to May (nucleus, April 1st to 10th); II., June 15th to 30th; III., August to beginning of September.—*Gonepteryx rhamni*, L., *G. cleopatra*, L.

Gen. I. vel II., primaria.

I., March 10th to May; II., May (at the same time as the end of I. gen.) to June (nucleus, towards the middle of June); III., September 15th to October 15th.—*Pieris napi*, L.

Gen. II. vel III., primaria.

I., March 10th to May (nucleus, April 15th to 30th); II., June to July 20th (nucleus, June 15th to 25th); III., August to September (nucleus, September 10th to 20th).—*Pieris manni*, Meyer.

Gen. III., primaria.

I., October 15th to May; II., June; III., August to October 15th.
—*Colias croceus*, Fourc. (*edusa*).*

[In *C. croceus* (*edusa*), which emerges all through October, a marked change of aspect is clearly discernable towards the middle of the month, when, a few days after the most tardy females of the III. gen., males begin to appear with all the characteristics of the spring individuals; they are followed in favourable years by corresponding females and when these are numerous the emergence in the following spring is distinctly lesser, showing a IV. gen. is not produced.]

I., October to May; II., June to beginning of August; III., end of August to September; IV., extraordinary, October. — *Rumicia phlaeas*, L.

I. (October), March 15th to May; II., end of May to June; III., August to September. — *Pontia daplidice*, L., *Colias hyale*, L. (*).

(*) There emerge in Florence during October and November a few individuals, mostly males, of *C. hyale*, which are undoubtedly autumnal precocious individuals of the I. gen., similar to those of *croceus*, but less frequent. In southern Latium Querci has observed in exceptionally favourable years a similar phenomenon in *P. daplidice* and *P. manni*.

I., April to May; II., beginning of July; III., end of August. — *Papilio machaon*, L., *Issoria lathonia*, L., *Loweia dorilis*, Hufn.

I., April to beginning of May; II., end of June; III., August to September. — *Erynnis* (*Carcharodus*) *alceae*, Esp., *E. (C.) altheae*, Hub., *Brenthis dia*, L.

I., May to beginning of June; II., July; III., September 1st to 15th. — *Limenitis rivularis*, Scop. (*camilla*).

Summary of the successive annual periods of emergence in Florence.

Towards March 10th, when the anemones and the narcissi are in bloom, a sudden abundant emergence (1) of the five species of *Pieris*, of the *Colias*, of *polychloros*, of *egea*, and of *megea* takes place, and a few days later of *aegeria*; these are joined by *c-album*, *atalanta*, *rhamni*, and *cleopatra*, which have hibernated at the imago stage. From the end of March to about April 10th there is (2) a notable decrease in the emergence of the Rhopalocera (I. partial pause). After this period begins (3) the emergence of the species which have their nucleus at the end of April and in the early half of May. In the latter month these are joined by other species, and an epoch ensues which is one of the richest of the year in diurnal Lepidoptera. In the first week of June (4) a new diminution takes place in the emergence of butterflies generally (II. partial pause). The richest of all epochs then follows, (5), in which many new species, amongst which the *Vanessidi*, add themselves to the II. gen. of the trigenerates, and to the I. gen. of the bigenerates. At the end of this period the *Satyri* commence to appear, and they go on emerging even during (6) the summer pause, in which period nearly all species disappear, except *C. pamphilus* and *H. lupinus*, Costa [*lycaon*?]; the latter period of pause lasts from about July 20th to about August 5th. There then follows (7) an abundant emergence, chiefly consisting in the II. gen. of the bigenerates, followed towards the middle of the month by various summer species, such as *betulae*, *statilinus*, *briseis*, and by the beginning of the III. gen. of the trigenerates. The result is that this is the

second richest period of the year as regards the abundance of individuals of many species; it extends to about the middle of September. At that time (8) nearly the whole of the butterflies cease emerging and the later part of September is characterised by the abundance of individuals of many species, but mostly old and worn. In the later half of October a small emergence (9) of various species takes place in favourable years, consisting in individuals which should have emerged only in the following spring. For instance, on the 26th and 28th of October, 1918, specimens recently emerged of the following species were collected in the Pian di Mugnone; they represent precisely the species which usually emerge as late, except for *C. pamphilus*, which was missing in that locality; they all were identical with the spring individuals, except *armoricanus*, whose females are at this season more numerous than at any other time of the year, and which belonged to the II. gen.: *H. armoricanus*: several ♀♀ (♂♂ all worn); *R. phlaeas*: several of both sexes; *P. icarus*: several of both sexes; *A. thetis*: 1 ♂; *P. megera*: several of both sexes; *P. aegeria*: 1 ♀; *C. hyale*: 1 ♀ (all the ♂♂ very worn, of III. gen.); *C. croceus (edusa)*: both sexes abundant; *P. rapae*: 1 ♂. Finally (10) during the winter, when a few mild days occur, a few *croceus*, *megera*, and *phlaeas* emerge, together with *polychloros*, which is our winter butterfly par excellence; *atalanta* and *Gonepteryx*, which are wintering at the imago stage, are then also seen on the wing.

Brenthis pales, its history and its named forms.

By H. J. TURNER, F.E.S.

(Continued from Vol. xxix., p. 134.)

In mid-December, 1900, was published in the Proceedings of the Entomological Society of Berlin a report of the meeting held on September 21st, 1899 (*Berl. Ent. Zeit.*, pp. 41-3), at which Herr Hensel spoke concerning the *Argynnis pales* forms in his collection, at the same time exhibiting a large number of examples of this butterfly obtained by himself. The various misleading varietal names attached to the alpine aberrations in this section he purposely did not take into account; he noted that, for a critical revision of the species, it was necessary to have more extensive material, and this would mean a monograph.

The specimens exhibited divided themselves first of all into two groups, I. The Alpine specimens, II. The examples from the plains (*arsilache*).

The Alpine *pales* varied in two extremes. The characteristic markings of the first section perhaps indicated by the typical *pales* form were as follows:—

- a. Size of males and females the same, being about midway between *A. dia* and the smaller race of *A. selene*.
- b. Shape of fore-wing elongated and pointed. Outer-margin slightly or barely arched, so that the whole wing makes nearly an obtuse angled triangle.
- c. Colour of upperside: Ground colour of both sexes the same rust red, in the ♀ somewhat duller than in the ♂, the markings black, sharp and clearly defined.
- d. Colour of underside: On the forewings the black marking indistinct

and only slightly apparent, or faintly shows through from the upperside here and there. On the lower wings the dark rust-red portions are sharply defined from the yellow or mother-of-pearl shining spots. (In one aberration there are two spots of the two outer rows of spots on the hindwings run together into longish pearl spots. On the underside of the hindwing the yellow is missing, except that at the outer marginal angle it is reduced to an obsolescent trace.)

The examples which belong to section I. are from meadows which were not damp, and were taken at a height of about 1900m. (about 6000ft.), e.g., on the Schmittenhöhe.

In strong opposition to the examples referred to above were those which the exhibitor had placed in the section II. The characteristic markings were as follows:—

- a. Size about as *aphirapē*, *ino*, and so on. ♀ generally larger than the ♂.
- b. Shape of forewings broad, outer margin strongly convex; in especially extreme specimens a tangent drawn nearly through the terminal point of vein 4, will make an angle with the produced inner margin very close to the wing.
- c. Colour of upperside: The two sexes differ, ground colour in the ♂ clear, usually pale red, the black markings thin and feeble, in many specimens still more pale. Ground colour in the female a whitish gray, usually obscured by greenish, variegated scaling, especially on the forewings, the rusty yellow powdering quite suppressed; the black markings are strong and not sharply marked, but mingling somewhat with the ground colour in many examples. Further, many females also show between the markings strong blackish powdering as a dark blue-violet shimmer, just as do the females of *Brenthis ino*.
- d. Colour and marking of underside: Black markings generally quite wanting on the forewings in the ♂, in the ♀ they are mostly feeble and imperfectly developed. On the hindwing the markings are washed out in the ♂, in the female on the other hand the rusty red markings here and there become brown or greenish.

The examples belonging to section II. come mostly from the Glockner neighbourhood, and were caught in damp places at a height of about 2,000m. (about 6,600ft.).

With regard to Group II. the *pales* form of the level open country, the var. *arsilache*, also native to Berlin, he merely mentioned that it was larger than the Alpine examples, and the most intensely strongly coloured of all the *pales* forms known to the exhibitor. The form of the fore-wing is pointed and elongate as in Group I., but the black markings (especially the band of the middle discal area, which becomes obsolete toward the exterior) much sharper and broader. The forewing also exhibits on the underside sharp and distinct marking; ♂ and ♀ have almost the same ground colour.

Fruhstorfer, *Iris*, xvi., p. 306 (1903), described three forms which he called new sub-species of *Brenthis pales*.

1. *Brenthis pales* sub. sp. *palina*—"Is very near *sifanica*, Gr. Gr., but is somewhat larger, of more pointed wing shape and on the hind-

wing longer haired. The black marking of all the wings is more extended, and this is especially noticeable in the marginal area.

- "The black median band of all the wings is at least double as wide as in typical *pales* and *sifanica*, but less robust than in *arsilache*.
- "Undersides: Compared with *sifanica* they are just as in *eupales*, all the red-brown spots, bands and dots are much extended, especially the basal spots, and the discal band is strongly pronounced. The sub-anal silver spots which are present in *sifanica*, are much reduced, as in *eupales*, and commonly absent. Habitat: Ta-Tsien-Lou, Sias-Lou, Setchuan."
- 2. *Brenthis pales* sub. sp. *korla*.—"Differs from all known *pales* races by the extraordinary broad wings, which are suffused with an intense violet shimmer.
- "All the black markings are strongly reduced, whence *korla* has a brighter appearance, just as *sipora*, Moore, has. The black basal region of the hindwing is equally diminished and approaches *palina* and *eupales*.
- "By the very bright underside *korla* again suggests *sipora*, but it has less black marking than *sipora*.
- "The sub-discal silver spotting is obsolete, the brown basal spot much darker. The base of the hindwing is well scaled with pale-gray green, and differs thereby from the brightest females from the Engadine, of which I have about a hundred for comparison.
- "The white markings of the hindwings, especially the anal spot, are much brighter and broader than in *pales*.
- "*Korla* forms, in this way, a transition between *pales* and *sipora*, and on account of the much broader wing is quite the largest form of *pales* yet known." Habitat: Korla.
- 3. *Brenthis pales* sub. sp. *eupales*.—"Together with the grand *Parnassius imperator* var. *augustus* and *Argynnis clara* var. *manis*, my Indian correspondent sent me a new *Argynnis*, which is obviously a south Thibetan representative of our *pales*.
- "*Eupales* ♂ upperside differs from *pales*, to which it is appreciably nearer than to *pales* var. *generator*, by the much wider black bands and spots and the darker wing-bases.
- "Underside: On the forewings the black bands are likewise more sharply emphasised, and all the reddish markings are darker brown.
- "The hindwings are duller, the bands and spots yellow-brown in *pales* are dark red-brown and narrower, and much more toothed and notched. This indentation is caused by the restricted, but more sharply curved silver spots.
- "The ♀ also shows on the upperside of the forewing wider bands, and the apex bears a distinctly marked bright yellow spot. The apical part of the forewing underside is broad bright yellow, and merges into a short band of a bright red-brown. The marginal area has red-brown markings.
- "Hindwing underside: This is, above all, characterised by a narrow, sharply dentate, almost wholly black discal band, which has a bright, silvery-coloured area in the middle. The brown sub-basal spot is almost triangular, and sends a sharp prolongation into the middle of the wing. The submarginal and sub-anal dots and spots are of a deeper brown, and brighter coloured than in *pales* ♀."—S. Thibet.

Bingham, in *Faun. Brit. Ind. Butterflies*, vol. i., p. 447 (1905), gave *sipora*, Moore, and *baralacha*, Moore, as synonyms of *pales*, and gave *generator* as the race taken in Chitral, etc., and Turkistan and Afghanistan. It is larger than the type, ground colour paler and brighter, black markings much reduced. Undersides paler than in *pales*, but similar; ground of hindwings very pale yellow, almost white sometimes; silvery-white markings much less conspicuous and reddish, much paler. Chitral specimens smaller.

Aigner-Abafi, *Schin. Aber. (Ann. Mus. Nat. Hung., 1906, p. 502, plt. xiii., fig. 8)* described a new form of *pales* as *ab. nigra*.

"This form agrees with the figures of Freyer, *Neu Beit., Vol. II., plt. 187, fig. 1*, and Wagner, *IV., Jahresber. d. Wein. Ent. Ver., 1895, plt. 1., fig. 4*, in all respects.

"Sooty-brown coloration throughout, only in the marginal area of both wings a row of yellow-brown, longish blotches. The undersides of the forewings are without markings, reddish brown, the apex brighter; immediately at the base of the hindwing lie 3 large milk-white spots, which are coloured similarly to the spots in the marginal area and are disposed lengthways; all other markings are wanting. ♀ 84mm."

The figure shows silvery spots.

In 1908 Herr Stichel published a paper in the *Berlin Ent. Zeit.*, a contribution to the fauna of Northern Europe, and on pp. 81-84 described a new sub-species of *Brenthis pales* under the name of *aquilonaris*, and gave a figure of it, plate III., fig. 5. He also in the same place discussed various melanistic forms, and reproduced the figure of *ab. inducta*, Sändberg, given by Sahlberg in 1893, *Med. Soc. Fr. Fl. Fenn., p. 205, fig. 5*, on plate III., fig. 6.

"*Habitu A. pales* var. *arsilache* minoris. Alae supra fulvae, signaturis dilatatis, in area media anticarum nonnunquam confluentibus; anticis subtus nigromaculatis, posticis nimis rubiginosis, minus argenteo-maculiferis, fascia discali transversa ochracea nigro fimbriata angustissima."

"A subspecies hitherto undescribed of what, I take to be, our most variable Argynnid. The general impression almost that of a small specimen of *arsilache* (type)* from Germany.

"Upperside of the wings dark reddish brown, the usual markings of the species on the whole emphasised. Thus in the disc the spots across the wing are occasionally joined to form an irregular band and longitudinally are confluent in a similar way. The black marginal spots on both wings are enlarged, often being united to form a complete marginal band, particularly on the distal margin of the hindwings where the united black triangular spots rest on the marginal band and are only separated from the margin exteriorly by fine streaks or small crescent-shaped spots. Towards the base the hindwings are black for a considerable area.

"The Underside: forewing with distinctly black spots, but standing separately. Hindwing strikingly variegated; ground colour, rust-red predominant, mixed with ochre-yellow in the disc. The very narrow transverse ochre-yellow band following the red-brown basal area is

* "*Esper's original arsilache is from Franconia (Bavaria). I am unable to determine whether the North German examples differ from this, but take it for granted that they are in agreement.*"—STICHEL.

margined by black, angular and wavy lines. In the discal area a row of indistinct small spots; that in front of the middle of the intermediate area circular, with white, or whitish centre. This intermediate area, which in typical *pales* is usually quite yellow, here—just as in *arsilache*—is only brighter than the rest of the distal portion of the wing. On the distal margin stands a row of small silver spots, the rest of the wing area is somewhat sparsely silver-spotted; occasionally there is only one round spot at the base behind the median, and a longish spot at the end of the cell. From 3 males of the consignment, Gellwara Coll., Herr Rangnow."

"This form produces a bright, fiery impression, and was first captured flying over a swamp by Rangnow as a *Chrysophanus*. In one of the original specimens the spots in the middle area of the forewings are completely coalescent. It has altered my opinion. I wonder whether the specimens here are the same as the examples identified as *arsilache* from other places in the adjoining Arctic regions, for I consider this as probable. Also I do not feel justified in stating whether this newly described form belongs to a local subspecies, or has varied from *lapponica* on account of locality and environment, as Staudinger says. He writes, *Stett. e. Zeit.*, 1861, p. 347: "*Arsilache* is the form occurring in wet swamps, equally whether these lie in the open country or on the mountains; *pales* on the other hand comes only from Alpine meadows, which in the far north are elevated in various places but little above the level of the sea." "Towards the end of June we caught the first typical *arsilache*, and always indeed on moist swamps, rather grass- than heath-swamps. In the neighbourhood of such swamps and on the grassy meadows adjoining both forms also flew together, but I never took a *pales* in the middle of a swamp nor an *arsilache* in the middle of a dry meadow."

"Two males of var. *lapponica* lie before me from Floifjeld and Svendborg (Norway), they are dun-brown with scantier marking and smaller spots, I can make out no valid apparent distinction from single individuals from Switzerland; here, as in many cases of artificial race determination, the personal factor must have come in.

"As an illustration of the variability of the species, there comes into my mind also such a form from Upper Bavaria (3 males of my collection from Berchtesgaden, above 1,200 metres). These are distinguished by their size (forewings 20mm.), slender, angular wing-form, vivid reddish-brown ground colour, black basal powdering of the hindwings broad and extended up to the anal angle, very strongly red-brown coloured underside (darker than in the described northern form), and abundant silver spotting on it. I limit myself to the statement of these characters because my material appears too small to demonstrate a local characteristic and a racial qualification of the form."

Herr Stichel then referred to the various other melanistic forms which have been described.

"Strand states that *pales* occurs at Tromsø as var. *arsilache*, and that form *lapponica* var. *napaea* was first met with in S. Norway. (*Ber. Nat., Ver. Regens.*, vii., 1, 98-9.)

"Sven Lampa records also var. *isis* from Lapmark, Dalarne and Norway, but he appears to have had var. *napaea*. (*Ent. Tid.*, 1885.)

"Schiilde mentions bright, blue-red glistening examples with

obliterated markings on the undersides as in *pales*. (2 specimens.) (*Stett. ent. Zeit.*, vol. 34, p. 176.)

"Hoffmann states that in the North Finland *lapponica* the wing-surface is frequently suffused with a strong darkening. (*Stett. ent. Zeit.*, vol. 54, p. 124, 1893.)

"A magnificent melanic northern aberration has been named:—

a. form inducta, Sändberg, *Ent. Tid.*, 1882, p. 129; Sahlberg, *Med. Soc. Fn. Fl. Fen.*, p. 205, pl. 5; *Ber. Ent. Zeit.*, 1908, pl. iii., fig. 6.

"Melanic forms of the species are frequently observed in southern districts:—

b. form nigra, Aigner, *Ann. Mus. Nat. Hung.*, 1906, p. 502.

"Upperside wholly sooty-brown, longish spots only in the distal area of both wings. Underside: forewing without markings, hindwings with three large white basal spots, on the distal margin white elongated marginal spots, all other markings wanting. From Ochsenheimer's collection. Agrees somewhat with Freyer's figure, *Neu. Beitr.*, vol. ii., pl. 187, fig. 1. Somewhat closely agrees with Hübner's figures, *Eur. Schm.*, vol. I., 617 and 618.

"*A. pales* ab., Wagner, *Jahresb. Wien. Ent. Ver.*, 4, 1895, p. 46, pl. 1, fig. 4. From Carniola. Above 1,500m.—Upperside blackened, but the ground colour here and there, *e.g.*, in the distal area, showing through.

"*A. pales* ab., Hirschke, *Jahresb. Wien. Ent. Verz.*, 16, 1905, p. 5, pl. 1, fig. 3. Hochschwab, Steirmark, July.—Fore- and hindwings blackened up to the distal area.

"*A. pales* var. *arsilache* ab., Galvagni, *Ver. z-b. Gess.*, vol. 52, p. 586. Santigjöchel, Odernberg, 1900, August 19th. Only the forewings blackened on the basal half, hindwings partly indistinctly darkened without real marking (with fig.)

"A name may here be reasonably given for the development of this melanic characteristic. If one carries on the bestowal of names on individuals, one must also bestow a name on the butterfly here mentioned, for none of the others occur like it.

"According to Pagenstecher its distribution is over Arctic Europe and Asia. Also the most northern European locality is Hammerfest. (Romer and Schaudien, *Fn. Arct.*, 1898, vol. ii., pt. 2, p. 324, 1901.)

Gillmer, in *Int. Ent. Zeit.*, vol. ii. (1908), p. 396, sums up what is known of the larva and ovum of var. *arsilache*, which is practically negative evidence. The imago frequents moors and marshy meadows, and is especially attracted by the flowers of *Eupatorium cannabinum*, *Comarum palustre*, *Lychnis flos-cuculi*, and especially by the thistles, it is also often found held by the sundew *Drosera rotundifolia*. Many marsh plants in its localities have been searched for larvæ and ova, but unsuccessfully.

In 1908 Oscar Schultz, in *Soc. Ent.*, vol. xxii., p. 179, described an aberration of *Brenthis pales*, and gave the name *thales* to it.

"The upperside of all the wings are much darkened; only on the outermarginal area are traces of the brown ground colour to be found (in the form of rings or streaks). In extremely developed examples of the aberration, silver spots run together in a radiate way are found on the underside of the hindwings. This aberration has been met with frequently. An extreme form of it was caught by Wagner at

Dobratsch (Villacher Alp) in 1895 (underside of hindwing with silver streaks), see *Jahresbericht Wien. Ent. Ver.*, 1895, p. 45. A few very dark examples were obtained by Galvagni on July 25th, 1900, on the Blaser in Tirol (Brennergebiet), see "*l. c.*," 1900, p. 5. A further example at the same place by him on August 10th, 1901, see "*l. c.*," 1901, p. 6. This aberration was taken by Pfitzner at the end of July, 1904, in the Roseggthal, near Pontresina, see *Iris*, 1906, p. 213. An intermediate form was obtained by himself in the Heutal in 1904, in which the hindwings below were suffused with green-yellow with a dark margin, see *Iris*, 1906, p. 214. A later very dark example with silver streaks on the underside hindwings was found at the end of June, 1907, in Tirol (Brennergebiet). A figure of an extremely developed example of the *ab. thales* is given in *Jahresb. Wien. Ent. Ver.*, 1895, on pl. i., fig. 4."

Seitz (Schultz) *Mac. Lep. Pal. Fn.*, vol. i., p. 230, pl. 67, i. and 68, a. b. (25 figs.) (1909), gave short diagnoses of some 21 forms of *pales*. He described a new form *banghaasi*, from a specimen taken at Kentei. "Its upperside is very strongly spotted with black, the forewing beneath bearing weak spots and the hindwing being very silvery. It is an *arsilache* form."

Seitz diagnosed the variation as follows:—

- ab. isis* = upperside pale ochreous.
- ab. napaea* ♀ = shaded with dark olivaceous greenish.
- ab. thales* = upperside almost entirely black, only vestiges of the reddish-yellow ground colour in the outer area.
- ab. mediofasciata* = great development of the black, confined to the median area.
- ab. killiasi* = markings of forewings absent except small traces, but more strongly developed on the hindwings; base, disc and veins more extended black.
- var. graeca* = large form (rather), ♂ very bright red, very distinct ocelli in outer half of hindwing beneath, chequered fringes, strong markings on underside of forewings below. Veluchi, Parnassus.
- var. balcanica* = transition to *graeca* from Balkan Mts.
- var. caucasica* = smaller, ♂ very bright brick-red, much paler beneath, dark markings of ♀ sometimes as if dusted with flour.
- var. sifanica* = smaller than *caucasica*. Sinde, in Thibet.
- var. arsilache* = distinctly black-spotted forewing underside, wings broader and more rounded, larger than Alpine *pales*. Swamps.
- var. inducta* = dark northern form. cf. *napaea*. Lapland.
- var. lapponica* = smaller than *arsilache*, diffuse markings on forewing below, washed out. West north Europe.
- var. generator* = ♂ upperside very bright reddish-yellow, very small dot-like markings, sometimes obsolete in the median area, ♀ whitish lunules before outer margin. Central Asia.
- var. korla* = much larger, upperside red like *generator*, violet gloss, broad, strongly rounded wings, markings of hindwing below dull and obsolescent. Korla.
- var. eupales* = very brightly variegated underside, moss-green spots, cinnamon smears, all very dentate and indented, silvery gloss strongly reduced. Thibet.
- var. palina* = rather small, ♀ strongly marked above, but little silvery

gloss below; red-brown colour strongly enlarged in all spots, bands and dots. West China.

var. *darjana* = more fiery-red than *generator*, median area entirely without markings, black colour reduced at base of forewings and abdominal margin of the hindwings. Syr Darja.

var. *sipora* = above and beneath as *arsilache*, black markings abundant and prominent, spots in middle of forewing thinner and sparser in the ♂, base very black; in ♀ only the outer marginal area of hindwing is not black. N.W. Himalayas.

var. *baralacha* = sparse markings of both sides (cf. *sipora*), base hardly blackened in ♂, hindwing almost unicolorous, various colours weak and diffuse. N.W. Himalayas.

In 1913, Fritz Wagner, *Beitr. Lep. Illegibetes*, &c. (*Cent. Asia*) in *Ent. Mitt.*, Vol. II., p. 114, discussed the form of *B. pales* sent from that area.

"*Argyanis pales* var. *generator*, Stgr. Stgr. "Cat." III., 210. *Alph. Lep. Kouldja*, p. 409.

"Taldi gorge, mid June to end of August; Burchan gorge, beginning of July; Usek gorge, end July.

"The individuals obtained from this neighbourhood in great numbers vary extraordinarily in the male sex; yellow to fiery orange is present in all gradations, as also all intermediates have been captured from strongly marked examples to those before me, which beyond the cross veins and a row of fine black points before the margin of the forewing possess scarcely any further marking. The underside of the hindwing is tolerably contrasted, bright reddish mixed with much yellow. One aberrant ♂ with very pale upperside has the underside of the hindwing almost uniform fawn colour, the reddish markings indicated only. The size of the specimens varies between 35-41mm. in the ♂ and reaches 44mm. in the female sex.

"While the females of the form now collected by me as typical *generator* possess a uniform character throughout (dark red brown with distinctly emphasised black markings), the large series obtained from the Juldus Gebiete differ so extraordinarily, that on this ground there is a direct suggestion for the necessity of a complete separation from the former. Therefore with this further not unimportant distinction I must separate them from *generator* as var. *juldussica*. As characteristics the following can be taken:—

"The size generally smaller, the undersides of all the wings always in the male, often in the female, distinctly paler, the uppersides duller brown colour in the male sex and the outer part of the marginal area of the females. Most of the female individuals show a blackish green, which compares almost with that of the var. *napaea*, yet it can vary very nearly to a whitish isabella-coloured tone; dark red brown females, such as I obtained from localities mentioned previously, appear to be altogether wanting there, at least, there lies before me no example thus coloured.

"Alpheraky, who mentions this form, and the great variability of the dark females of it already in his collection, ascribed it wrongly to the *græca* of Stgr., which identification has already been corrected by Staudinger and Wocke in the *Catalogue* 1901 in so far as they unite the above-mentioned form to *generator*.

"The var. *darjana*, Seitz described most recently, is confined

to the male, without taking any consideration of the appearance of the females, and must therefore, laying due emphasis on the exceedingly large variability of the males in colour and marking, be regarded as only an aberration."

(To be continued.)

Collecting in several places in 1916-1918.

By Major P. P. GRAVES, F.E.S.

(Concluded from page 66.)

I will conclude these notes by giving some brief account of the specimens of Heterocera and of "other orders" taken in South Palestine, and by a few corrections and additions to the previous articles under the above title.

SOUTH PALESTINE.

Of the Heterocera seen or taken at Umm el Kilab, far the most abundant was *Cerocala scapulosa*, which literally swarmed from September to November. It was not very variable. In October, late in the month, and in November till the weather broke, i.e., about the 18th of the month, *Thaumatopoea herculeana* var. *judaea* and *Chondrostega* (?) *subfasciata* occurred in some numbers at light. *Amicta febretha* was taken sparingly. *Melicleptria scutosa* occurred with *C. scapulosa*, but much less frequently. *Plusia gamma* was of course frequent. I got very few *Craspedia minorata* in October and early November, and still fewer *Rhyacia* (*Agrotis*) *ripae* in the latter month. Those taken were very pale. Other Heterocera recorded were *Euxoa segetum*, *E. pierretii*, *E. tritici*, *A. ypsilon* (not uncommon) from late September onwards; *Cardeia irrisor* var. *deserticola* somewhat rare, *Athetis clavipalpis* (*cubicularis*) not uncommon in November, *Earias insulana* frequent throughout, *Thalpochara ostrina* not uncommon from September, *T. parva* much rarer in late October, an *Acidalia* which may be *A. mareotica*, and *Eupithecia oblongata*.

Further I took *Laphygma exigua* at Der el Belah, in August. Two or three Noctuids taken near Umm el Kilab, in November, have not yet been identified.

Of the "Micros" I recognised *Noctuelia floralis*, *Cynaeda dentalis*, and *Ancylolomia palpella*. Two other species are reported by the Entomological Section, Ministry of Agriculture, Cairo, to be *Cornifrons ulceratalis* and *Anerastia ablutella*. But the great majority of my Micros are now in the hands of Mr. Durrant, and will, I hope, prove interesting.

Of the "other orders" I should like first to note the unexpected lack of variety of Orthoptera in the veldt. *Sphingonotus azurescens* and *Truxalis unguiculata* were taken near Der el Belah, or seen there, not uncommonly in late July and August. I saw very few grasshoppers near Umm el Kilab, and all I took proved to be the common *Caloptenus italicus*. Among the Coleoptera taken the following have been identified by Cairo:—*Scarites eurytus*, *Anthia searmaculata*, *Graphipterus serrator* and *G. rotundatus*, *Julodis onopordi* var. *ehrenbergi*, *Blaps* (?) *kollari*, *Ptinus* (?) *xylopertha*, *Machlopiis crenatocostata*, *Aphodius lividus*, and another thus far unidentified *Aphodius*, *Trox granulipennis* with some Carabids, Bostrychids, and a *Gonocephalum* which are still unidentified.

Of the Neuroptera I took *Creagris cinerascens* commonly at Umm el Kilab, and a species of *Chrysopa* which is not represented among the Egyptian specimens at Cairo. *C. cinerascens* was out throughout September and October, and often flew to light at night.

The Hymenoptera were poorly represented at Kilab. There I took *Dorylus oraniensis* occasionally in September and later, *Aphaenogaster barbara*, *Mutilla rufipes*, *Myrmecocystus viaticus*, and of course *Campodorus maculatus*. With these Cairo reports unidentified species of *Ammophila* and *Pompilus*, and a Braconid. At Der el Belah I took, on August 3rd, males of *Dielis collaris* and a single *Ammophila tydei*.

Of the Diptera I took three hitherto unidentified species of Asilids, and some Sarcophagids and Tachinids also unidentified, with a species of *Argyromoeba*, this last at Der el Belah.

Of the Heteroptera-Homoptera I find Cairo to have identified *Lygaeus militaris* and *Liorhyssus hyalinus*. A Jassid was not uncommon on herbage at Umm el Kilab in the autumn.

SCORRIER.

I should add to the butterflies I took at Bude in August, *Melanargia galathea*, which occurred in bad order near Bude. At Scorrier *Dryas paphia* and *Celastrina argiolus* were more than uncommon, they were rare. I was informed by a school boy collector that *Plebeius aegon* (*argus*) had been more frequent earlier in the month of July, and that many *Pyrameis cardui* had been about in late May.

The Odonata noted at Scorrier were *Cordulegaster annulatus*, *Orthetrum caerulescens*, and a *Sympetrum*, apparently *striolatum*. At Bude *C. annulatus* was common, and I took or saw *Calopteryx virgo* in mid-August at two or three pools in the little Bude river. An Agrionid, which I am almost sure was *Enallagma cyathigerum*, occurred occasionally on the canal at Bude as late as the beginning of September. Finally I may note that on two occasions in August, at Bude, I saw a very large dragonfly, which I took to be a female of *Anax imperator*, though I know that this is a very late date and believe that the species in question has not been taken so far south-west.

ADDITIONS AND ERRATA.

Ent. Record, vol xxxi., p. 5, for "tide" read "Nile." p. 62, for "Ramlew" read "Ramleh." p. 62, *P. icarus*, add "male specimens have very white undersides and particularly rich violet-blue upper-sides." p. 64, for "*autonia*" read "*antonia*." p. 65, Akaba and Suez, add "*Zizeeria karsandra*" to the insects noted at Suez on June 1st.

Ent. Record, vol. xxx., p. 63, line 1, for "distinguished" read "undistinguished." p. 63, lines 8, 27, 32, 52, for "*A. crameri* var. *esperi*" read "var. *graeca*." p. 64, line 11, for "October 14th" read "April 10th." p. 64. line 30, for "var. *esperi*" read "var. *graeca*."

SOME NEW RECORDS FROM THE CONSTANTINOPLE DISTRICT.

On June 26th I visited the downs near Kuchuk Chekmejé, E. of the Chatalja lines, to hunt for Satyrids, since I had not previously visited this ground in June. I took in an hour and an half 12 specimens of *Melanargia larissa*; a large form, which appeared to me to be lighter than a few (worn) which I have from Artaki, Marmora, Asia Minor. With these occurred in smaller numbers a very fine race

of *M. galathea*, averaging about 57 mm. in expanse (females) as against the 50 mm. of the ordinary *M. galathea* v. *procida* from sandstone and schistose formation on the Bosphorus. Kuchuk Chekmejé is a limestone area, seemingly Cretaceous. It was too hot, shade temperature nearly 100°, to do much collecting that day, but on the 29th June I visited the ground again and took a few more of each species in spite of a high wind. On July 20th and 27th, on the ground where I had discovered *Lucina* on April 20th this year, I caught 4 fresh and 2 slightly worn specimens of this species, thus, I think, definitely establishing, at all events, its partial double-broodedness in this area. These second brood specimens of the "Duke of Burgundy" were slightly smaller than those of the first brood. On the 20th July I took a very worn female of *Lampides boeticus*, oddly enough the first time I have caught this ordinarily very common Mediterranean and tropical species near Constantinople. Most insects have been rare if of second broods, or of species emerging in late May, June, or early July, this year; I refer to such things as the second broods of *Celastrina anteros* and *Celastrina argiolus* which latter was for the first time rather uncommon in the Belgrade Forest area in June, and to the Argynnis, except *Dryas pandora*, and Satyrids such as *Pararge roxelana*, *Satyrus circe*, etc. I attribute this scarcity to some three weeks of extraordinarily cold, wet and windy weather, which followed a fine, dry and early spring. *Bithys quercus* did not turn up at all.

Acalla reticulata, Ström.=*contaminana*, Hüb.—Its History and its Variation.

By H. J. TURNER, F.E.S.

Although many previous references and descriptions by older authors may refer to this species, Hübner is the first author upon whom we can rely with complete certainty as to the identity of the insect indicated by the name *contaminana*, Hb. ("Tort." fig. 142).

The following notes were made from the copy of Hübner's *Saml. Tortrices*, in the Walsingham Library at South Kensington (B.M.).*

Hübner. *Saml. Tortrices*, figs, 142, 171, 173. [1797.]

Fig. 142 is a good average figure of the common *contaminana* form, but the apex is not produced sufficiently and the hindwings are too dark for an average.

Fig. 171 is larger than the usual British specimens of the *ciliana* form, but as to markings the colour is "off." They are dull brown and certainly have no trace or suggestion of ferruginous. The hindwings of the fig., however, are more nearly correct in being uniformly dirty white or cream than in fig. 142.

Fig. 173 is a light figure of *rhombana* of a deeper brown than fig. 171, with a complete fascia of about uniform width, and a triangular blotch on the costa, the remains of the other arm of the Y in *contaminana*. There is no basis of ferruginous as there is in all the numerous specimens referable to *rhombana* which I have seen. Nor is there any suffusion of the very dark fuscous except that the fascia and

* In dealing with these old hand-coloured books it is necessary to specify the particular copy, as the copies, often coloured to order subsequent to the original issue, vary *inter se*, and due allowance must also be made for age deterioration. blotch are of that colour. The hindwings are as dark as in fig. 142,

with a much darker wide marginal cloud. The shape of the forewing is much too pointed, in fact not at all comparable to the real shape of the species. I would even call it malformed. If this be a *contaminana* form, then the very dark practically uniform specimens are worthy of a varietal name without a doubt.

Phalaena obscurana. Donovan. *Nat. Hist. Br. Ins.*, vol. xi., p. 40, pl. 374, fig. 2. [1804.]

"*Tortrix obscurana*. Anterior wings somewhat ferruginous, obscurely clouded and speckled with fuscous; posterior wings pale."

The figure (nat. size) and the enlargement do not agree. The former has no speckles and no cloud nor fascia, only an indistinct smudge in the disc, and a small dark triangular spot where the basal transverse line should begin on the costa. The colour is considerably more than "somewhat" ferruginous in both figures. The veins are well marked in the marginal area, but there are no reticulations marked. The cloud on the enlarged figure is in no way like the marking I have seen in any of the specimens I have examined.

Inspection of the figure justifies one in identifying it as *ciliana*, Hüb., hence the name *obscurana*, Don., must be considered a synonym of *ciliana*, Hüb.

The first description of *contaminana* subsequent to Hb. is that of Haworth as follows:—

Haworth. *Lep. Brit.*, p. 419, no. 80. [1812 (11).] *Tortrix contaminana*.

"T. alis acutis stramineis, rufo pulcherrime reticulatis, costa basi, fasciaque media sinuosa bifida ustulatis.

"*Tort. contaminana*, Hüb. Tort. 142. Ph. *Pyralis xylostean*a (Haw), *Prod. Lep. Brit.*, 32. [1802.]

"Descriptio. "Simillima praecedentibus (*ciliana*, no. 79) ut distincta, nempe vix unquam variat: sed solum differt ab ultima, fasciâ mediâ anticarum alarum, quae maxima est, et ad costam grosse seu ineleganter bifida.

"β. Macula straminea in postica parte fasciae anticarum alarum.

"Obs. In English cabinets this species is frequently named *xylostean*a."

Haworth. *Lep. Brit.*, p. 419, no. 79. [1812 (11).] *Tortrix ciliana*. Hüb. Tort., 171.=Ph. *obscurana*, Don. xi., 374.

"T. alis acutis ferrugineis, fusco rufove reticulatis, fascia media abbreviata obliqua costali saturatiore."

"Descriptio. Praecedenti (*rhombana*) nimis affinis et forte varietas, sed differt in fascia media abbreviata, nec completa usque ad marginem tenuiorem. Etiam variat.

"α. Alis anticis laete ferrugineis, lente paululum reticulatis fasciâ obscurâ obliquâ brevissimâ parum saturatiore medio marginis crassioris; margine ipso postico tenue ustulato: posticis albidis, seu pallidis fuscescentibus, ciliisque omnibus albis.

"β. Alis anticis saturatioribus, sive sordide testaceis, ustulato conspicuè reticulatis: cacteris ut in α.

"γ. Duplo major, alis anticis pallide testaceis, rufo sordidè ut conspicuè reticulatis caeteris ut in α.

"δ. Statura α, vel subinde duplo major alis anticis pallidissime

testaceis, sive stramineis, absque fasciâ, sed omnino rufo pulcherrime reticulatis."

This is the first description of the *ciliana* form subsequent to Donovan's very short inadequate explanation of his figure.

Haworth. *Lep. Brit.*, pp. 418, no. 78. [1812 (11).] *Tortrix rhombana*. Hb. 173.

"Alis acutis ferrugineis subreticulatis fascia completa sinuosa media nigricante."

"Descriptio. T. bifidanae similis sed dignoscitur primo intuitu, alis anticis apice acutis, nec obtusis, sive retusis."

Variat.

"a. Alis anticis saturate ferrugineis, obsolete fusco reticulatis, strigâ obsoletâ ante medium; fasciâque mediâ sinuosâ vix obliquâ completâ ustulato-fuscis; et inter hanc fasciam et marginem posticum, maculâ costali etiam ustulato-fuscâ; posticis pallide fusciscentibus, vel albicantibus; ciliis omnibus albis, sed in anticis alis, ad angulum ani ustulatis.

"β. Fere duplo minor, alis anticis magis ferrugineis; caeteris ut in α.

"γ. Anticis pone fasciam mediam, maculis duabus fusco-ustulatis, una costali, altera opposita disci: caeteris ut in β.

"δ. Alis anticis sordide ferrugineis fusco plus minus suffusis, fasciis maculisque obsoletis; caeteris ut in ultimis.

"e. Alis anticis omnino fuscis, immaculatis, costa ipsa solum tenuissime ferruginea: caeteris ut in δ.

"f. Alis, ciliis, costaque ipsa omnino fuscis immaculatis: caeteris ut in ultimis."

In the above description (the original description) Haworth says "T. bifidanae similis." Subsequent authors recognise *bifidana*, Haw., as *ferrugana*.

In the above three descriptions and the varieties shortly diagnosed Haworth gives a very fair summary of the aberration usually met with in this species. But it must be noted that this is not the *rhombana*, Hb. 173.

In [1821] Charpentier, with Notes by the talented Zincken g. Sommer, revised the micro-lepidopterous portion of the famous *Verz. Wien.* of Schiffermüller in his *Zun. Wick. Schab. etc., Verz. Wien.*, with the actual collection of the latter before him.

A. Charpentier (Zincken). *Zun. Wick. Schab., etc., Verz. Wien.*, p. 47. [1821.]

"Schiff. W.V., p. 128, no. 10. *Tort. rosana* = *Tort. contaminana*, Hub., 142.

He says:—"I feel quite sure that Linné's *Tortrix rosana*, *Sys. Nat.*, xii., p. 876, and *Fn. Suec.*, no. 1314, belongs here, it cannot be put to *T. sorbiana*, Hüb., as Lespeyres does in Illiger's Magazine. The 'Fauna' describes this *Tortrix* quite recognisably, especially the words at the end: 'alae superiores postice emarginatae, margine nigricante.' The shape of Hübner's figure of this *Tortrix*, which I possess in a considerable variety, is not quite true to nature."

Charpentier does not consider the whole description which, as Zincken points out below, is quite exclusive of *contaminana*. Linné has confused the species in x. when editing xii.

Note by Zincken g. Som: "Hübner's *T. contaminana* is in no way the *T. rosana*, Linn. In the former the forewings are '*pallidae ferrugineo reticulatae*,' the hindwings '*niveo sericeae*,' but Linné says '*alae omnes griseae seu dilute testaceae, tam supra quam infra*.' This description is also given to *T. sorbiana* in which the forewings are (schalten) blackish shade, black below, the hindwings black gray (fuscae) above. To no Tortrix does the description fit better and more generally than to the female of the Tortrix *pyrustrana* (!). Further there is no figure of this known to me, to which I can refer, and Hübner has only depicted the male (fig. 124), which is quite different from the female. Therefore Linné's description of the figure is distinctly sufficient for the general appearance if only one considers the words '*fascia obliqua*' not too rigidly, but as two rusty-brown lines in which the intermediate space is somewhat darker only towards the innermargin."

Linné's description may have been from one of the forms of *contaminana*. Zincken's criticism appears well grounded.

B. Charpentier (Zincken). *Zum. Wick. Schab., etc., Verz. Wien.*, p. 48. [1821.]

"Schiff. *W.V.*, p. 128, no. 11. *Tort. ameriana* = *Tort. contaminana*, Hüb.

"Here in Schiffermüller's collection is found a very worn pale example of *T. rosana* = *contaminana*, Hüb. It is just like a pale variety in which there is not even a slight trace of the obscure spot on the margin.

"Whether Linné's *ameriana* is possibly only a similar variety is not ascertainable. He says in the 'Fauna' under no. 1310 (where *amerina* stands for *ameriana*, but which in the *Sys. Nat.* (xii.—H.J.T.) is cited with the use of the same diagnosis under the no. 1310 as *ameriana*) '*Simillima rosanae*.' But the words '*litura communis ferruginea*' appear to betoken another species.

"Fig. 6 and 7 in *Reaumur*, vol. ii., plt. 18, which Linné cites, is quite unrecognisable, even in the quarto edition. So also are the figures 5, 6, 7, 8 and 9 of plate 15 of vol. ii., of which Fabricius remarks: 'These probably depict several species.'" These remarks are quite justified.

Zincken g. Sommer remarks: "The *T. amerina*, Linn., I believe I recognise in Hübs. fig. 124, ♂ *T. pyrustrana*. The words '*simillima rosanae*—*alae retusae*—*litura communis ferruginea*' leave it as very conjectural. I must here note that the '*litura communis ferruginea*' which extend not far from the bend of the inner margin somewhat obliquely to the middle of the wing area, in Hübner's figure run quite up to the costa, and here form with the '*litura*' a '*fascia*' or '*striga*' which never occurs thus in this Tortrix."

C. Charpentier (Zincken). *Zum. Wick. Schab., etc., Verz. Wien.*, p. 59. [1821.]

"Schiff. *W.V.*, p. 128, no 7. *T. rhombana* = *T. rhombana*, Hüb., 173."

It will be seen from the examination of the various works to which we have referred that the *T. rosana* of Linné, *S.N.*, x., *Fn. S.* and *S.N.*, xii., may or may not refer to the species which Hübner subsequently called *contaminana*. While in *S.N.*, x., and *S.N.*, xii.,

the descriptions are too meagre and cover several species readily, that in *Fn. S.* is prolix and may possibly refer to one of the darker forms of *contaminana*, although the remarks of Zincken preclude even this suggestion. The reference of Linné to *Mad. Merian's Eur.*, i., is of no avail, as the figures are quite unrecognisable. The remarks as to *sorbiana* and *pyru(a)strana* all rest on "may-be."

Exactly similar remarks apply to the *T. americana* of Linné, *S.N.*, x., *Fn. S.*, and *S.N.*, xii., and the figures in both *Merian, Eur.*, i., and *Reaumur, Mem.*, ii., are equally unrecognisable as to specific identity.

It will also be seen that *Fabricius, Sp. Ins.*, iii., and *Ent. Sys. auct.*, iii. (?) adds no further evidence.

The extreme variation in *contaminana* and the paucity of material which Linné had access to (probably at most only two or three specimens) leaves it quite possible that both *rosana*, L., and *americana*, L., were forms of *contaminana*, Hüb.

The statement and fact upon which we are justified in relying so far, are that the specimens in *Schiffermüller's* collection labelled *rosana* and *americana* were actually specimens of *contaminana*, and this identification was confirmed much later by the identification of *Herrich-Schäffer*, who also saw the identical specimens of the "*W.V.*" collection.

Herrich-Schäffer, Sys. Bearb., vol. iv., p. 153 [1849], says:—"The *W.V.*, p. 128, *rosana*, dog-rose Tortrix, is this species. There are two specimens in the collection, one unset, yellow with somewhat obliterated dark brown band, and one set, very bright yellow with very dark brown band.

"The *W.V.*, p. 128, *americana*, the sawfly Tortrix. A good pale yellow specimen, in place of the band it has only a reddish-brown three cornered spot on the costa. Both species (*rosana* and *americana*) *Charpentier* considers as *contaminana*, Hüb., 142, and *Treitschke* also refers *ciliana*, Hüb., 171, as a variety of it. They are indeed rightly *contaminana*, Hüb., 142."

If we could directly connect and identify the *rosana*, *W.V.* (1776), and the *americana*, *W.V.* (1776), with the Linné descriptions (1758, -61, -67) we should have, according to the rule of priority, to allow the name *contaminana* to fall, unless stronger evidence pointed to another species included in the generality of Linné's description. Thus, after very careful comparison and investigation of all references, figures, descriptions, reviews, opinions, etc., it has been possible to collect, no further evidence is forthcoming, and it seems practically impossible to identify, with any degree of certainty, any of these early descriptions with the insect so long called *contaminana*, Hüb.

There are, however, other of the older descriptions and names which may with some degree of certainty apply here, one of which is the insect figured by *De Geer*, and referred to as—

"*Phalaena Pallium reticulatum.*" *Retzius. De Geer (Lister). Gen. Sp. Ins.*, p. 51. [1783].

"*Spirilinguis antennis filiformibus, alis rhombeis fuscis maculis strigisque obscuris: inferioribus supra nigrescentibus, palpis recurvis.*" (*T. 2*, p. 468. *T. 1*, p. 408, t. 27, f. 1-8, 11-14) (*L.S.N.* 876).

Mr. Sich's remarks (*in lit.*), "*De Geer's P. reticulatum* seems to me

to be out of the running on account of its '*palpis recurvis*,' conclusively dispose of this reference.

Another description is that of Ström, *Nye Saml. k. Danske Vid. Selsk. Skrift.*, p. 86, sp. 120 [1783], who described a Tortrix under the name *reticulata*. After considerable trouble owing to the reference being insufficient, and with the kind assistance of my colleague Mr. J. H. Durrant of the Brit. Mus., I have found the description referred to and also a translation from the original Norwegian by Herr Schöyen in *Stett. e. Z.* [1880], 41, p. 135, which I here append.

"*Phalaena tortrix (reticulata) alis flavo-ferrugineis, reticulatis, macula marginali curva fusca.* Sie ist etwas kleiner (als die nächst vorige, *Tortrix maculata* benannte Art) vorn breiter als gewöhnlich, von gelbrauner Farbe auf den Vorderflügeln, die viele braune Linien längs und quer haben und am äusseren Rande, gerade in der Mitte, einen dunkelbraunen Fleck wie einen Winkelhaken, dessen unterster Zweig jedoch ganz fein und wenig kenntlich ist, jenen breiten gegenüber. Die Hinterflügeln sind weisslich, ebenso wie der Leib und die Beine. Sie gleicht der *Phalaena tortrix moderiana*."

Ph. tort. moderiana has been identified as *ferrugana*.

Schöyen states that this determination necessitates the replacement of *contaminana*, Hb., by Ström's prior name *reticulata*. This determination took place 40 years ago, and was adopted by the great Scandinavian entomologist Wallengren, who, *Christ. Vid. Forhand.*, no. 2, p. 18 [1880]; *Ent. Tidsk.*, ix. 172 (Dan. Scand. Lap. Norv.) [1888], also critically examined Ström's descriptions. J. H. Durrant, Kennel, and others all agree in this determination, and Staudinger inserts it with a ?

Still another old description possibly relates to this species, viz., that of

Tortrix centrana, Fab. *Ent. Sys. auct.*, vol. iii., pt. 2, 273. [1794.]

"*Alis flavis: litura media cruciformi fusca.* Habitat Parisiis Dom. Bosc.

"*Magnitudo et statura P. forskahlianae. Caput et thorax flavescentia. Alae anticae flavae litura magna, media, cruciformi, fusca. Posticis albidae.*"

Mr. Sich also disposes of this reference. "With regard to *centrana*, Fb., if of the same size as *forskahliana* it would be too small for *contaminana*." (*in litt.*)

Two other early references are added.

Harris. *Pock. Comp.*, p. 49, no. 342. [1775.]

"Yellow brown with three broad brown bars."

Possibly refers to *ciliana*, as Stephen's *Cat.* says.

Harris. *Exposition*, p. 94, pl. 28, fig. 2, 3 (enlarged). [1782.]

No name.

A quite recognisable figure as to reticulation and fascia of the *contaminana* form, the colour of course is weak.

Fabricius. *Ent. Sys. auct. Supp.* [1798], p. 479. *Tortrix reticulana*. P. alis flavis fusco strigosis arcuque magno costali fusco."

"*Magna. Corpus cinereum. Alae anticae flavae strigis numerosis, fuscis et in medio costae macula magna fusca in cuius medio macula costalis flava. Posticae cinerae.*"

Froelich, in 1823, refers to this with reserve, and we can well at this distant date let the reference fall as indeterminate, especially as no references to figures or descriptions are given by Fabricius.

In [1826] in his *Verz.*, Hübner summarises as follows under 3 different Genera.

"*Aleimma contaminana*. Hüb. *Verz.*, p. 392. (Hüb., *Zutr. Tort.*, 142.)"

"*Amelia rhombana*. Hüb. *Verz.*, p. 390. (Schiff. *WV.*; *Tort.* D.7; Hüb. *Tort.* 173.)

"*Acalla ciliana*. Hüb. *Verz.*, p. 383. (Hüb. *Tort.* 171.)

Of these three genera since *Acalla* was the earliest, and since the three Hübnerian species are forms of the same species, *Acalla* is the generic name which has been adopted for *contaminana* in Staudinger's *Catalog* (following Meyrick). But this is another question. Meyrick adopted *Acalla*, but subsequently dropped it without comment in Wyttsmann's *Gen. Ins.* and *Lep. Cat.* for the name *Peronea* of Curtis, which in turn may probably have to fall before *Oxygrapha*, Hüb. *Verz.*

Froelich. *Enumeratio Tort. Wurt.*, p. 26 [1828], points out the raised scales on the wings, etc., and describes and names a new (?) form as *T. dimidiata*.

"No. 26. *T. contaminana* alis anticis retuso-apiculatis pallide flavicantibus rufo-reticulatis; macula costali fusca, puncto disci niveo, fimbria alisque posticis albis.

Hüb., 142. *Charp.*, p. 47. *Fabr. Sup.*, p. 379. *Pyr. reticulana* (?).

"*L. frequens* Elvaci in *Pyro sylvestris*. July, August.

"*Colore multum variat*. *Alae anticae* jam dilute luteolae jam luteo-testacea fusco aut rufo reticulatae. *Macula costalis* major minorve, aut rufa aut fusca saepe fasciae-formis marginem internum attingit ad costam interrupta, rarissima nulla. In disco semper punctum niveum e squamis elevatis adest, facile obliterandum."

"No. 27. *T. dimidiata* alis anticis retuso-apiculatis brunneo-fuscis immaculatis: puncto disci fimbriaque dimidiato niveis, posticis fusco-cinereis.

"*L. rarior* in sepibus. October.

"*Habitus et summa affinitas antecedentis (contaminana)*, et forsan varietas ejusdem; at serior apparet nec frequens. *Figura alarum* omnino eadem; *anticae fusco brunneae immaculatae*, raro strigulis flammeo brunneis, et puncto niveo discoidali elevato notatae, *posticae obscuriores cinereae, nec albae*. *Caput et thorax obscure ferruginea*."

Hübner. *Tort.*, figs. 299, 300. [1829 or 30.]

Figs. 299 and 300 are quite the same except that the general coloration differs. In 299 it is of a rich very deep fuscous brown perhaps intended as a reference to the ferruginous basis in many forms (*ciliana*). The hindwings are also of a corresponding grade of colour. In 300 it is of a fuscous black and the hindwings are of a corresponding grade of colour. The dark shading in both figures are exactly the same in area and shape. These areas are the basal, outer marginal, and a blotch on the costa connected by a costal darkening. Hübner calls these figures *dimidiata*. They are certainly not the *rhombana* of Hüb. 173.

(To be concluded.)

Catalogue of Palæarctic Psychides.

No apology is, I hope, necessary for reprinting the List which appeared in Tutt's *British Lepidoptera*, Vol. II., pp. 431-434 (1900). This List was never published in the *Entomologist's Record*, and it will probably be of interest to some collectors who do not possess the volume in which it appeared, yet may now, as it is hoped, be inclined to take an active interest in the Group.

The List is printed exactly as produced by Mr. Tutt, except that the necessary correction has been made in the identification of *Acanthopsyche atra*, L., which had been confused with *Ptilocephala plumifera*, O. The species have been numbered for my own convenience in sorting out the large material comprised in Dr. Chapman's collection and my own additions—with the microscopic mounts, which I am preparing. A certain modification has also been introduced in the difference of type for clearness, at the suggestion of Mr. J. Hartley Durrant.

In approving of my wish to reprint Mr. Tutt's List, Dr. T. A. Chapman writes me:—"Dissoctena is quite wrongly placed. *Solenobia*, *Taleporia* and *Luffia* should all be in one Family (Tribe?) to which *Dissoctena* does not belong, but is probably nearer Tutt's *Bijugis*."

My opportunities of study are too small to allow me to search for signs of further progress in the subject since *British Lepidoptera* was published. Mr. H. J. Turner has called my attention to a List published by Dr. Rebel in Spuler's *Schm. Eur.*, II. (July, 1906—additions 1910). This List appears to approximate closely with the species enumerated in Staud. and Rebel's *Catalog.* (1901). Seitz *Macrolepidoptera of the World*, Vol. II., 1913, describes and figures the "Macro" portion of the Palæarctic *Psychides*, but this cannot be compared with Tutt's complete list.

Dr. T. A. Chapman in *Entomologist's Record*, Vol. XV., p. 324 and XVI., p. 67, describes and figures a new species which he names *Pyropsyche moncanella*, and assigns his new Genus to a position between *Arctus* and *Psyche* in Tutt's list.—C.R.N. BURROWS.

PSYCHIDES.		6 dardoinella, Mill.	C
NARYCHIDÆ.		MELASINIDI.	
NARYCHIINÆ.		Melasina, Bdv.	
NARYCHIDI.		7 ciliaris, Ochs.	C
Narycia, Stphs.		8 lugubris, Hb. ♀	C
1* monilifera, Geoff.	C	9 melas, Bdv.	
var. atrella, Stphs.		10 punctata, H.-Sch.	
ab. ochracea, Tutt		11 melana, H.-Sch.	
2. astrella, H.-Sch.		SOLENOBIDÆ.	
DIPLODOMIDÆ.		SOLENOBIINÆ.	
DIPLODOMINÆ.		SOLENOBIIDI.	
DIPLODOMIDI.		Solenobia, Dup.	
Diplodoma, Zell.		11* inconspicua, Sta.	C
3* herminata, Geoff.	C	? var. triquetrella, Edl.	
var. siderella, H.-Sch.		? var. wockii, Barr.	C
4 adspersella, Hein.		13 nickerlii, Hein.	
LYPUSIDÆ.		14 wockii, Hein.	C
LYPUSINÆ.		15 suifunella, Christ.	
LYPUSIDI.		16* lichenella, Linn.	C
Lypusa, Zell.		17 cembrella, Linn.	
5 maurella, Fab.	C	var. pineti, Zell.	C
PENESTOGLOSSIDI.		ab. alba, Tutt	
Penestoglossa, F. v. R.		18 fumosella, Hein.	

19	triquetrella, Hb.	♀	C	54*	scotica, Chapm.	
20	mannii, Zell.		C	55*	casta, Pallas	C
21	pallida, Staud.				* ab. minor, Chapm.	
22	clathrella, F. von R.				* var. (et ab.) intermediella, Brd.	
TALEPORIIDAE.						
TALEPORIINAE.						
TALEPORIID						
	Bankesia, Tutt			56	germanica, Chapm.	C
23*	douglasii, Sta.			EPICHNOPTERYGIDAE.		
24*	staintoni, Walsm.		C	BIJUGINAE.		
25	conspurcatella, Zell.			BIJUGIDI		
26	vernella, Const				Bijugis, Heyl.	
27	montanella, Walsm.			57	bombycella, Schiff.	C
28	alpestrella, Hein.		C		var. rotundella, Brd.	
29	defoliella, Const.				var. elongatella, Brd.	
Taleporia, Hb.						
30*	tubulosa, Retz.		C	58	proxima, Led.	C
	ab. guénéi, Zell.			59	pectinella, Schiff.	C
	ab. minor, Tutt				var. perlucidella, Brd.	
31	politella, Ochs.			60	alpherakii, Heyl.	
32	borealis, Wocke			61	vestalis, Staud.	C
33	improvisella, Staud.			EPICHNOPTERYGINAE.		
Sciopetris, Meyr.						
34	technica, Meyr.			PSYCHIDEIDI.		
35	pretiosa, Sta. (? genus)				Psychidea, Rbr.	
DISSOCTENIDAE.						
DISSOCTENINAE.						
DISSOCTENIDI.						
	Dissoctena, Staud.			62	sapho, Mill.	C
36	granigerella, Staud.		C	63	nocturnella, Alph.	
LUFFIIDAE.						
LUFFIINAE.						
LUFFIIDI.						
	Luffia, Tutt			64	nudella, Ochs.	C
37*	lapidella, Goeze		C		var. suriens, Reutti	C
	var. pectinella, Dup.			65	plumella, Ochs.	
38*	ferchaultella, Stephs.	♀	C	66	? nigrolucidella, Brd.	
	Bacotia, Tutt			67	staudingeri, Heyl.	C
39*	sepium, Speyer		C	68	millierei, Heyl.	
FUMEIDAE.						
PROUTIINAE.						
PROUTIDI.						
	Proutia, Tutt			69	flavescens, Heyl.	
40*	betulina, Zell.		C	70	kuldschaënsis, Heyl.	
41*	eppingella, Tutt			71	graeccella, Mill.	C
42	? salicolella, Brd.		C	EPICHNOPTERYGIDI.		
43	rouasti, Heyl.				Whittleia, Tutt	
FUMEINAE.						
FUMEIDI.						
	Bruandia, Tutt			72*	retiella, Newm.	C
44	reticulatella, Brd.		C	73	undulella, F. v. R.	C
	var. obscurella, Chapm.			Epichnopterix, Hb.		
45	raiblenis, Mann			74	mentonella, Mill.	
46	comitella, Brd.		C	75*	pulla, Esp.	C
47	norvegica, Schöyen				var. silesiaca, Standf.	
	Masonia, Tutt				var. sieboldii, Reutti	C
48	saxicolella, Brd.				var. heringii, Hein.	
49	edwardsella, Tutt				var. pullisimilella, Brd.	
50	subflavella, Mill.		C		var. plumistrea, Haw.	
51	mitfordella, Chapm.		C		var. innitidella, Brd.	
52*	crassiorella, Brd.		C		var. montana, Heyl.	
	var. (? sp. dist.) affinis, Reutti		C	76	ardua, Mann	C
53*	hibernicella, Chapm.		C	77	alpina, Heyl.	
	Fumea, Haw.			78	hofmanni, Heyl.	
				79	flavociliella, Mann	
				80	tarnierella, Brd.	C
					var. myrmidonella, Brd.	
PSYCHEOIDIDAE.						
PSYCHEOIDINAE.						
PSYCHEOIDIDI.						
	Stichobasis, Kirb. (Diabasis, Heyl.					
				81	helicinoides, Heyl.	
PSYCHIDAE.						
APTERONINAE.						
APTERONIDI.						
	Apterona, Mill.					
				82	crenulella, Brd.	C
					var. helix, Reutti	

83	<i>helicinella</i> , H.-Sch.	C		<i>var. abencerragella</i> , Mill.	
	<i>var. gracilis</i> , Speyer	C	115	<i>wockeï</i> , Staud.	
PSYCHINAE.			Oreopsyche, Speyer		
PSYCHIDI.			116	<i>vesubiella</i> , Mill.	
	Aretus, Rbr.		117	<i>pyrenaella</i> , H.-Sch.	C
84	<i>praececellens</i> , Staud.			<i>var. albescens</i> , Heyl.	
85	<i>graslinella</i> , Bdv.	C	118	? <i>tubanivicinella</i> , Brd.	
86	<i>calberlae</i> , Heyl.		119	<i>kahri</i> , Led.	C
87	<i>bruandi</i> , Led.		120	<i>leschenaulti</i> , Staud.	C
88	<i>apiformis</i> , Rossi	C		<i>var. nigricans</i> , Staud.	
	<i>var. siculella</i> , Brd. (=melasoma, Staud.)		121	<i>silphella</i> , Mill.	
Psyche, Schrk.			ACANTHOPSYCHINAE.		
89	<i>detrita</i> , Led.		ACANTHOPSYCHIDI.		
90	<i>viciella</i> , Schiff.	C		Oiketicina, Heyl.	
91	<i>stetinisens</i> , Hering	C	122	<i>inquinata</i> , Led.	
92	? <i>stigmatella</i> , Zell.		123	<i>staudingeri</i> , Heyl.	
93	<i>viadrina</i> , Staud.	C		Acanthopsyche, Heyl.	
94	<i>constancella</i> , Brd. (millieriella, Led.)	C	124*	<i>atra</i> , Lin. (opacella, H.-S.)	C
95	<i>turatii</i> , Staud.	C		<i>var. senex</i> , Staud.	
96	? <i>minutella</i> , Geoff. (Fourc.)		125	<i>maritimella</i> , Brd.	
	<i>Sterrhopterix</i> , Hb.		126	<i>zelleri</i> , Mann	
97*	<i>hirsutella</i> , Hb.	C		<i>Pachythelia</i> , Westd.	
	<i>var. fusca</i> , Haw.		127*	<i>villosella</i> , Ochs,	C
98	<i>standfussi</i> , H.-Sch.			<i>var. nigricans</i> , Curt.	
PHALACROPTERYGIDI.				<i>var. silesiaca</i> , Heyl.	
	Standfussia, Tutt			<i>var. hirtella</i> , Ev.	
99	<i>tenella</i> , Speyer	C		<i>var. cinerella</i> , Dup.	
100	<i>zermattensis</i> , Frey	C		Amicta, Heyl,	
	Scioptera, Rbr.		128	<i>oberthueri</i> , Heyl.	
101	<i>plumistrella</i> , Hb.	C	129	<i>jordani</i> , Staud.	
	<i>Leptopterix</i> , Hb.		130	<i>uralensis</i> , Frr.	
102	<i>schiffermilleri</i> , Staud.	C		<i>var. demissa</i> , Led.	
	<i>Ptilocephala</i> , Rbr.		131	<i>grunmi</i> , Heyl.	
103	<i>plumifera</i> , Ochs.	C	132	<i>ecksteini</i> , Led.	C
	<i>var. valesiella</i> , Mill.	C	133	<i>lutea</i> , Staud.	C
	<i>var. castiliana</i> , Staud.			<i>var. armena</i> , Heyl.	
104	<i>angustella</i> , H.-Sch. (atra, Esp.)	C	134	<i>febretta</i> , B. de F.	C
	<i>var. bicolorella</i> , Bdv.	C		<i>var. albipunctella</i> , Mill.	
	<i>Phalacropterix</i> , Hb.			<i>var. lambessa</i> , Heyl.	
105	<i>muscella</i> , Hb.	C	135	<i>tedaldii</i> , Heyl.	
106	<i>mediterranea</i> , Led.		136	<i>sera</i> , Wisk. (heylaertsii, Mill.)	
107	<i>fulminella</i> , Mill.		137	<i>quadrangularis</i> , Christ.	
108	<i>crassicornis</i> , Staud.			<i>Canephora</i> , Hb.	
109	<i>sicheliella</i> , Brd.	C	138	<i>unicolor</i> , Hufn.	C
110	<i>gondebantella</i> , Mill.			<i>var. paleiferella</i> , Brd.	
	<i>Hyalina</i> , † Rbr.			<i>var. asiatica</i> , Staud.	
111	<i>albida</i> , Brd.	C	OIKETICIDI.		
	<i>var. millierella</i> , Bdv.			Eumeta, Walk.	
112	<i>plumosella</i> , Rbr.		139	<i>pungeleri</i> , Heyl.	
113	<i>lorquiniella</i> , Brd.	C	140	<i>japonica</i> , Heyl.	
114	<i>malvinella</i> , Mill.		141	<i>minuscule</i> , Butl.	
			142	<i>pryeri</i> , Leech	
			143	<i>aurea</i> , Butl.	

* occur in Britain.

C contained in Chapman collection.

† Dr. Chapman states that if *Hyalina*, Rbr., be diagnosed by having seven nervures to cell, then its species (judged by those in Constant's collection) are—*albida*, *lorquiniella*, *millierella*, *malvinella*, *mediterranea* and *silphella*. He further adds that in Constant's collection, *leschenaulti* has a case with very wide-spreading straws, whilst *silphella* has a smooth earthy case like *nudella*. In the British Museum collection the case of *leschenaulti* is smooth and earthy like that of *silphella*.

SCIENTIFIC NOTES AND OBSERVATIONS.

VARIATION IN *DIAPHORA MENDICA* IN IRELAND. — Dr. Cockayne is mistaken in supposing that the var. *rustica* is the only form of the male of *D. mendica* occurring in Ireland.

The late Wm. F. de Vismes Kane records dark forms of the male from Counties Clare and Galway (*Catalogue of the Lepidoptera of Ireland*).

In this district the males vary from an almost pure white, var. *rustica*, through cream, pale buff, cream streaked with smoke, to a pale smoky grey; I have also this latter form from Co. Cork. The finest male I possess taken at light has all wings pale smoky grey with the central area of forewings white.—THOMAS GREER, Stewartstown, Co. Tyrone.

THE TERM "NYMOTYPICAL."—As there seemed some uncertainty and misunderstanding of the meaning and use of the term "nymotypical," I have asked Dr. Verity to give the precise meaning of the word, as he is using it in the interesting and valuable articles he is contributing to our pages. He has sent the following definition:—"The adjective 'nymotypical' is meant to designate the race of a species or the individual form of a race, which was used by the author of the name of that species or race to describe it. In some cases it has unfortunately turned out to be quite an unusual race or form and not the most highly characteristic or the commonest of the group, to which it has subsequently been proved to belong, and to which the name has had in consequence to be extended. As the word 'typical' might quite naturally in its simplest and most usual meaning be thought to designate the latter, the word 'nymotypical' has been coined to obviate this confusion, and to refer more precisely to the former."—R.V. [H.J.T.]

NOTES ON COLLECTING. Etc.

SPHINX PINASTRI IN SUSSEX.—On June 15th last we took a female of the above species in bred condition which laid about 100 eggs. These commenced to hatch on July 4th, but the larvæ have been doing very badly, and at present (July 26th) only a few are left, which are changing for the second time. The locality where found is surrounded by pine trees, and by the condition of the insect it in all probability emerged there. This is the first time this insect has been recorded for this country.—E. P. and P. A. SHARP, Eastbourne.

RECORDS FROM MUCKING.—During my 22 years residence at Mucking I have remarked the absence of *Pararge megera*. That so common a Butterfly should be absent was a bit of a puzzle to me, and I came to the conclusion that for some unknown reason this particular locality had some antipathetic qualities which forbid the settlement of one of the insects, whose perhaps rather delicate constitution appears to be driving more and more towards the west of England. This year, however, my doubts have been removed, for *megera* has appeared. I saw the first in the summer in the very primitive collection of a little boy, too young to deceive. On the occasion of Mr. Sheldon's visit on

the 21st inst. we saw a specimen flying along a field hedge—and twice this week visitors have reported to me that they have seen it about. It is curious that I have had to wait all these years to include it in the Mucking list.

Xanthia citrigo has always been a rare insect here. I had taken it very sparingly, and for only four separate seasons, here. This year promises better. Last week I found a specimen resting on the trunk of a lime-tree on the lawn, and today I found a male just expanding his wings as he climbed the same tree at 1.0 p.m. Perhaps the disturbance of being boxed unsettled him for he took a full hour to close his wings down.—(Rev.) C. R. N. BURROWS, 29th August, 1919.

NOTES ON *COLEOPHORA VIBICELLA*, HB.—*Genista tinctoria* grows abundantly on the almost treeless Ditchling Common near Burgess Hill in Sussex. On this plant towards the end of last May the half finished cases of *Coleophora vibicella* occurred in plenty. In the middle of June the larvæ had completed their cases and some of them had spun up for pupation. The *Genista* grows mostly in small patches and the cases are found generally on the outside of the patches always attached to the underside of the leaves so long as the larva is feeding. The larva mines several leaves on the same shoot, but only mines out small spaces and this causes it to make three or four holes (in one instance six) in each leaf. In this way the leaf except the base and apex may be mined out entirely. The mined leaves appear pale brown. The head of the full grown larva is black without markings. The thoracic segments are dark, smoky grey, with an ochreous tinge. The first, ninth and tenth abdominal segments are ochreous grey, while the intervening segments, second to eighth abdominals, are ochreous yellow. The prothorax carries a large black dorsal plate with a whitish anterior border and small black lateral plates. There are four small dorsal and two lateral plates on the mesothorax and the same on the metathorax, but the dorsal plates are there smaller. The anal shield is also black and rather large. The larva has not entirely lost the prolegs on the sixth abdominal, though they are reduced to mere points. Those on the third, fourth and fifth segments are quite normal and well provided with crotchets.

The case shining black, all of silk, varies between $\frac{5}{8}$ and $\frac{7}{8}$ of an inch and is fairly cylindrical, but somewhat restricted at both ends with an indentation down the centre of the lower part when the larva is feeding, but when the case is spun up for pupation the indented part is turned upwards. As in all the pistol cases that I know, the silk of added portions is first white, but in this instance very soon turns black. There are two rather small flaps at the distal end of the case. These may serve for two purposes, one to hide the opening of the case when inhabited by the larva, the other to give a secure foothold to the legs of the imago on emergence. When full grown the larva attaches its case to the stems of the foodplant, or occasionally to stems of other plants growing in the immediate vicinity. This year though the larvæ were very numerous, the imagines of this fine species were exceedingly scarce. I saw but three specimens on the wing and only succeeded in breeding a single one. One cause of this scarcity was the abundance of a small Hymenopterous parasite which attacks

the larva and emerges in quantities through a small hole at the top of the case.—ALFRED SICH, *August, 1919.*

[Of ten cases Mr. Sich kindly sent me, only one produced an imago, the remainder produced abundance of the small Hymenopteron.—H.J.T.]

AGRILUS LUNATUS IN SURREY.—My note in this Magazine, vol. xxx., p. 191, referred to an old specimen. It is therefore some satisfaction to be able to record a recent capture, for, in June last, while searching old hawthorns at Wimbledon for Longicorns, a fine specimen of the *Agrius* fell into the umbrella. Both specimens are females.—W. J. ASHDOWN, Leatherhead. *August 18th, 1919.*

NOTES ON ENTOMOLOGY IN FRANCE AND ITALY IN 1918 (*continued from page 134*).—June 3rd.—This afternoon I collected below, by, and above the waterfall behind the hill to the right of the village of Rigoroso. I believe the small gorge in which this waterfall is situated to be a very good collecting ground, but this afternoon the wind was extremely gusty and I could not test the locality well. I found *Hesperia carthami* well out and fresh, and *Agriades coridon*, both sexes, in abundance. *Papilio podalirius* and *Satyrus fidia* were present, but unapproachable. I got several *Pararge maera*, a fine large form. The males of *Agriades thetis* (*bellargus*) were common and fresh. I took one male *Scolitantides orion* in good condition, and on the steep slopes of the hill to the right of the stream below the waterfall, I found the beautiful tiger-lily growing wild in some abundance. *Hesperia malvae* were still quite fresh on the wing and also abundant.

June 7th.—Crossing the river Scrivia this afternoon by the wooden bridge, I turned to the left, and taking the first gorge to the right from the river bank, worked steadily up it, in time reaching the fir-woods on the hill-side above. *Polyommatus semiargus* was now out in both sexes. *Loweia alciphron* was getting more abundant, and I took the first female. *Coenonympha arcania* was now fully out, and I met with it constantly on bushes and hedges. A fresh specimen of *Issoria lathonia* and several of *Melitaea phoebe* were added to the list. So far the "fritillaries" had been scarcely represented among my captures. A new capture here was a specimen of *Syntomis phegea* drying its wings; it should shortly be abundant. I found that my captures of last evening at light were *Miana strigilis*, *Dipterygia scabriuscula* (*pinastri*), and *Mamestra pisi*. I have omitted to note that the females of *Epinephele jurtina* were at this date well on the wing.

June 9th.—My last evening's captures at the electric light were *Arctia villica*, *Dendrolimus pini*, *Lithosia deplana*, *Jaspidia celsia*, *Tiliacea aurago*, *Apatela aceris*, *Mimas tiliae*, *Rhodostrophia vibicaria*, *Nemoria viridata*, *Mamestra oleracea*, *Acontia luctuosa*, *Calymnia trapezina*, and *Panolis piniperda*. Collecting in the afternoon in the same gorge as on June 7th, I found *L. alciphron* more numerous and *Hypocrita jacobaeae* common. *P. semiargus* was well out in both sexes, and I took *Melanargia galathea* var. *procida*, although the males were far from being abundant. *Pyrameis atalanta* and *Limenitis camilla* were the only representatives of the Vanessids. *C. arcania* was now abundant in both sexes.

June 13th.—At the electric light in my own room last night I find

I took *Arctia villica*, *Notodonta trepida*, *Agrophila trabealis* (*sulphuralis*), *Thalera fimbrialis*, *Cabera exanthemaria*, *Ptychopoda humiliata* (*osseata*), *Phasiane petraria*, *P. piniperda* and *Calophasia lunula*. This afternoon I took the lane leading along the hillside the first turn on the right from the Villa Pisano, going towards Rigoroso. The *Lycaenidae* were very numerous. There were *A. coridon*, *A. thetis* (*bellargus*) both sexes, *Polyommatus amandus*, *Cupido minivus*, *P. escheri*, and *Plebeius aegon* (*argus*). *Coenonympha arcania* was in numbers. I was pleased to meet with *Strymon pruni*, three specimens. The females of *A. coridon* were very variable and I picked three very nice forms. *Zygæna lonicerae* was in numbers to-day. The above path skirts the hillsides for a considerable distance, and not only affords many deviations from time to time, but frequently in its winding course gives shade from the burning sun of the slopes.

June 15th.—Last night I took the following moths at the electric light in my room, viz., *Miana strigilis*, *Boarmia roboraria* (rare in N. Italy), *Phigalia pedaria* (*pilosaria*), and *Euchloris smaragdaria*. This afternoon I again went to the gorge, and though the wind was gusty I took *C. arcania*, *A. thetis*, and *A. coridon* in some numbers, as before, and also a fresh male of *Melanargia galathea* var. *procida*, by no means abundant. The pretty little Geometer *Lomaspilis marginata* was taken here. In a small clearing by the side of the stream running along this gorge, I saw on the top of a syringa bush a specimen of the tree-frog, and so well did it resemble its surroundings that it was only by its blue-green head and neck catching my eye that I became conscious that there was anything there at all, the rest of the body so closely resembled the colour of the leaves among which it was sitting watching me so attentively. They are extremely pretty creatures, and are stated to be fairly abundant here, although this is the first one I have seen.

June 19th.—The sirocco has been blowing hard for three days and has made all collecting quite impossible. This morning a friend brought me a large specimen of the glow-worm. In the afternoon I collected in the lateral valley, which commences immediately behind the Villa Vittoria, Arquata. This valley also has a small gurgling stream running down it, and there are numerous hilly paths at the end of the valley leading to higher ground. Here *M. galathea* var. *procida* were abundant, as also were *A. thetis*. *Thymelicus acteon* and *Setina irrorella* I took for the first time. *Hipocrita jacobaeae* was now common here in many places.

June, 20th.—A perfect day. Fine, sun tempered by a breeze not too strong to blow things about. To-day I did not leave the gorge to collect but penetrated far up it, crossed the stream by the little bridge near the cemetery, behind Vocemola, and followed the path through the pleasant woodland up the mountain side. The walk reminded me much of those favourite collecting grounds at Digne in the Basses-Alpes, or at St. Martin Vesubie in the Alpes Maritimes. Just inside the gorge *S. pruni* was to-day swarming at the blossoms of the privet, and farther up the blue-black "burnet," *Syntomis phegea*, with its double belt of yellow around its abdomen, was flying in some number. From tree to tree the restless *Limenitis camilla* flew up and down the stream as if in search of something new, whilst a little below the bridge *M. galathea* var. *procida* males were common and the females

just appearing. I took specimens of *E. smaragdaria* and *Rhodostrophia vibicaria*. In the little clearing near the bottom of the gorge I saw the first male of the Neuropteran *Ascalaphus longicornis*, which flies about the meadows of Southern Europe in June and July pretty commonly, and in North Italy is of frequent occurrence. Just by the cemetery a large stag beetle, *Lucanus cervus*, flew towards me, but as it neared me suddenly turned back across the stream. Unfortunately, for itself, at the moment it reached the trees on the other side, a bird, a shrike I think, darted at it, and although I was unable to see exactly what happened, the beetle disappeared as if by magic. I omitted to mention that early yesterday afternoon, whilst skirting what is here called "the Bluff," I saw a fine specimen of the dragon-fly *Libellula depressa* flying up and down the backwater on the Arquata side of the Scrivia, between the bridges, or at rest on the end of some overhanging twig hard by.

June 23rd.—A fine specimen of the hawk moth, *Hyles euphorbiae*, has just emerged, bred from a larva found last August at Hardelot, near Boulogne-sur-Mer, feeding on *Euphorbia cyparissus*. This afternoon I collected along the bottom of the hillside on the right bank of the river. *S. pruni* were in numbers on the privet, and with them a few of the curious moth, *Thyris fenestrella*. There also occurred the first specimens of *Argynnis niobe*, *Melitaea parthenie*, and *Erynnis lavatherae*, and the summer broods of *P. brassicae*, *P. rapae*, and *Celastrina argiolus* were on the wing now. *S. phegea* was abundant, and I captured both sexes of the dragon-fly *Calopteryx virgo*.

June 24th.—Another perfect day. As I stood on the bridge over the railway at Arquata to-day, the snowy mass of Monte Rosa, away to the N.W., appeared visible in the distance—some 110 miles away. How welcome is the shade, at this time of the year, afforded by the trees on either side of the main road, consisting of lime and the beautiful foliaged Italian acacia. They appear, however, not to have been planted very long, for no stranger seeing them for the first time in the early year would have dreamt how those leafless stems would in two months put forth a wreath of foliage sufficient to give to the passer-by such a real shade from the burning Italian sun of June and July. After lunch I climbed the steep hillside behind the Villa Pisano, and in the little lane, half shaded from the glare of the sun, the males and females of *S. pruni* were to-day joined by the males of *Chattendenia w-album*. *S. phegea* were crowding to the flowers of *Clematis vitalba*, while males of *Gonepteryx rhamni*, just emerged, were flying with fresh *Pyrameis cardui*. On the summit, reached by the ziczac path, were many flowering plants of the Tiger Lily, and on them were quite fresh specimens of *Zygaena carniolica*, a remarkable fact, as it was just five weeks after I first found it on Monte Berico, at Vicenza. A few *Acidalia ochrata* were taken on the hill-top.

June 26th.—Another *H. euphorbiae* emerged to-day. Along the hillside *S. phegea* was still abundant, fresh *P. cardui* and *Z. carniolica*, a male of *Melitaea didyma*, and numerous females of *M. galathea* var. *procida* were noted, the females of *S. pruni* being well out, and seemed to prefer the flowers of the *Clematis*. At light I took a specimen of *Theretra porcellus*.

June 27th.—The river Scrivia has shrunk so much that to-day I was able to ford it just above the wooden bridge. I continued up the right bank, having the village of Vocemola on my left until I came to

a clump of trees, just opposite the village of Rigoroso, situated above the left bank. Just behind this clump of trees is a little gorge, very interesting both for Botanists and Entomologists. To-day I found the summer brood of *Rumicia phlaeas*, some *Sesia stellatarum*, with fresh examples of *Dryas paphia*, *Lycaena arion*, *Thymelicus acteon*, *Adopaea flava* (*thaumas*), and *Hesperia carthami*, males only of the first two. Females of *C. minimus*, *A. thetis*, and *A. coridon* were in number. The *Ascalaphus* was here, and so also were males of *M. didyma*. At the electric light last night I took *Boarmia consortaria* and *B. crepuscularia*.

June 28th.—This afternoon I again visited the little lateral valley behind the Arquata Scrivia Hotel, but how different was the scene since my last visit on April 23rd. The brook that then came gurgling down was silent, and one walked up the bed, in places the only path, so luxuriant was the vegetation. On the hillside, on the left, which gets the afternoon sun, Lycaenids were in plenty. *Polyommatus escheri*, both sexes, were perhaps the most numerous; *L. arion* was there, too, always conspicuous by its peculiar flight. *M. parthenie*, *A. flava*, *H. acteon*, and the *Ascalaphus longicornis* were numerous and active. *M. galathea* was everywhere at this time, and large specimens of *P. brassicae* flew up and down the gorge.

June 29th.—In the first gorge to the left after crossing the bridge I found plenty of *S. phegea* with females of *C. minimus* in number. By the cemetery there is a steep pasture reached by a few steps out of the lane before the footbridge is come to, and to-day this was swarming with insects. Females of *P. semiargus* and *P. escheri*, a fine female *Loweia alciphron*, many *Melitaea didyma*, *T. acteon*, and *A. niobe* were among my captures here. The moth *A. ochrata* and the dragonfly *C. virgo* were also noted. Last night *Catephia alchymista*, *Leucania c-album*, and *Orrhodia vaccinii* came to the electric light.—C. B. ASHBY.

CURRENT NOTES AND SHORT NOTICES.

"The death of Frederick Du Cane Godman, D.C.L., F.R.S., has deprived the Entomological Society of the unique personality of one of its oldest and most distinguished Fellows, who was its President in 1891-2.

"It would not be too much to say that no single individual in the lifetime of the present generation has rendered greater service to the systematic study of Natural History, or contributed more generously to promote scientific work in the various branches of zoology, especially of ornithology and entomology, in which he himself took so great an interest. . . . No one recognised more clearly than Mr. Godman, from the days when he travelled widely in early life, that if a thorough knowledge of species and of the geographical distribution of species was ever to be obtained this could be accomplished only by patient and extensive collecting, and by bringing the results together to enable students to draw conclusions by the arrangement of specimens in systematic order. . . .

"The publication of the fifty-eight large quarto volumes of the *Biologia Centrali-Americana*, for which Mr. Godman bore the whole expense, including the employment of the necessary staff of collectors, occupied some thirty-five years, and was completed in 1915. Botany

and archaeology formed important parts of this great enterprise, the predominant features being zoology and entomology. Moreover, the type-specimens and series of many thousands of new species described and illustrated in its pages have been generously presented to the National Museum. His contributions in Lepidoptera alone amounted to 107,000—without counting sundry entire collections separately purchased.

"As a Trustee of the British Museum he knew personally what every one was doing or not doing in the Natural History departments, and was ever ready with useful suggestions and advice. His memory will be cherished and beloved alike by observers and students of nature in field and laboratory, and by his fellow-sportsmen in whose pursuits he was no mean companion. In short, it has been well said of him that 'his many talents added to his fine nature made a combination which inspired a marvellously affectionate admiration.'"

The above is taken from an "appreciation" contributed by Lord Walsingham to the *Proceedings of the Entomological Society of London*.

The following announcement in the *Times* was a great blow to many of us. "July 24th, of enteric fever, at 49 Hospital Chanak, Frederick Hova Wolley-Dod, of Midapore, Alberta, Canada, Second Lieut. York Lt. Inf't. attached to the Macedonian Labour Corps. Aged 47." During his stay in England Lieut. Wolley-Dod visited many well-known entomologists of the country, and he was a constant attendant at both the Entomological and the South London Societies meetings, as well as spending much of his spare time in studying the British Museum Collections, especially the *Noctuidae*, of which he had an excellent practical knowledge so far as the Fauna of North America is concerned. We, who had come to know him, mourn his loss.

A most useful list of the species and varieties of *Syrichthus* (*Hesperia*) of Western Europe and Algeria is given in the *Bull. Soc. ent. Fr.* for April, by M. Chas. Oberthür. This will be invaluable as a preliminary guide to those who in the near future will be able to recommence their study of the butterflies of the regions mentioned.

A very fine Report has been issued recently by the State Entomologist of Minnesota, A. G. Ruggles. It contains some 240 pages, with three admirably coloured and eleven black and white plates, and considerably over a hundred figures and diagrams. After a general summary dealing with the four groups of the year's work, inspection of nurseries, control of white pine blister rust, eradication of the common barberry, and the study of life-histories and control measures for insect pests, the following special articles are printed. (1) Life-history of an oak-twigg girdler (*Agrilus arcuatus*), A. G. Ruggles. (2) Potatoe Spraying in Minnesota, S. A. Graham, comparing the control value of the various insecticides. (3) The Carpenter Ant (*Camponotus pennsylvanicus*) as a Destroyer of sound Wood, S. A. Graham, showing how by a knowledge of the habits of the ants much timber could be saved. (4) A case of *Drosophila* (fruit-fly) puparia in certified milk, W. A. Riley, and its probable source in want of cleanliness. (5) Contribution to our Knowledge of the *Aphidae*, O. W. Oestlund. (6) The confused flour-beetle, *Tribolium confusum*, R. N. Chapman, a pest which has caused much loss during the late war period. (7) The Clover-seed Chalcid (*Bruchofagus funebris*), W. W. Williamson, not a parasite as originally described, but itself a serious clover-seed pest which is

attacked by three other species of Chalcids as parasites. (8) A first Report of the *Trombididae* mites of Minnesota, C. W. Howard, known as "chiggers," with seven plates of species and details; and (9) Nearly a hundred pages containing a Report of the Hymenoptera of Minnesota, F. L. Washburn, to which the three coloured plates belong, and having in addition about a hundred figures of species in illustration of the different families and genera, with half a dozen very full introductory plates of terms used in the descriptions. This last appears to be a most useful introduction to the study of the indigenous species in this hitherto but little-worked State.

In the *Rev. Mens. Namur*, R. P. Longin Navas, S.J., is contributing an annotated list of the insects of "other orders" found in Belgium. He has commenced in the June number with the Plecoptera and Trichoptera. F. Derenne is publishing a list of the more striking melanic forms of Belgian Lepidoptera, comparing them with the melanic forms found in Britain.

In the *Ent.* for June and July, G. T. Lyle contributes notes on the British *Braconidae* (Hym.). He adds as species new to Britain: (1) *Rhogas grandis*, bred from larvæ of *Amphipyra pyramidea*; and (2) *R. rugulosus*, bred from larvæ of *Arsilonche albovenosa*; as a species new to science *R. cantherius*, bred from larvæ of *Semiothisa liturata*. F. V. Theobald describes the following Aphides as new to science:—1. *Myzus gei* on wild avens, *Geum urbanum*, Kent. 2. *Myzus mercurialis*, on dog's mercury, *Mercurialis officinalis*, I. of Wight. 3. *Myzus galiifolium*, on bedstraw, *Galium cruciatum*, Kent, I. of Wight, and 4. *Aphis abrotaniella* on *Artemisia abrotani*, Cumberland.

The first two parts of the *Trans. Ent. Soc. Lond.* for 1919 contain I. "Butterfly Vision," by H. Eltringham, M.A., D.Sc., with five plates, one of which, showing "a Tortoiseshell butterfly as it might be supposed to appear to another of the same species," is coloured. II. "Synonymy and Types of certain genera of Hymenoptera," by Prof. J. Chester Bradley, M.S., Ph.D. III. "A Migration of Yellow Butterflies (*Catopsilia statira*) in Trinidad," by C. B. Williams, M.A., with five plates. IV. "A Note on Bonelli's *Tableau Synoptique*," by H. E. Andrews. V. "Notes on the Ancestry of the *Diptera*, *Hemiptera*, and other insects related to the *Neuroptera*," by G. Chester Crampton, Ph.D. VI. "On the types of Oriental *Carabidae* in the British Museum, and in the Hope Department of the Oxford University Museum," by H. E. Andrews. VII. "The British Species of *Andrena* and *Nomada*," by Dr. R. C. L. Perkins, M.A., with five plates. In the Proceedings the occurrence of a Californian "Plume" *Platyptilia* (*Amblyptilia*) *pica*, Wslm., in Scotland is announced. The specimen was beaten from juniper at Aviemore in September, 1918. It closely resembles a variety of *P. punctidactyla*. There is a series of interesting biological notes on Natal butterflies by C. N. Barker, communicated by Prof. Poulton, who subsequently gave an account of certain "eccentric movements of the hindwings" in *Celastrina argiolus*.

In the *Bull. Soc. ent. Fr.* (1919), p. 162, is a Mémoire containing a description of a new type of Strepsiptera, including a new genus *Eoxenos*, new to science, and the new species *E. laboulbenet*, by M. P. de Peyerimhoff, with a plate. Like numerous other species in this obscure order only the female has been met with.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

May 22nd.—A DESTRUCTIVE BEETLE.—Dr. Chapinan exhibited living specimens of *Trypodendron domesticum*, a beetle which burrows into the bark and wood of oak, from Netley Heath.

NUT WEEVILS.—Mr. Bunnett, the nut weevils *Balininus nucum*, *B. glandium*, and *B. tessellatum* from Keston, and the rare *Megatoma undata*.

LARVÆ OF *S. PRUNI*.—Mr. Syms, living larvæ of *Strymon pruni*.

COLEOPTERA, ABERRATIONS.—Mr. Ashdown, a rather scarce beetle *Ptinus searpunctatus*, *Attagenus pellio* with supplementary spots, and two *Hylobius abietis* showing much difference in size.

ABERRATION IN *C. EDUSA* AND *P. DAPLIDICE*.—Mr. Hy. J. Turner, *Colias edusa* from Cyprus, with dusky blobs at base of forewing, and several *Pontia daplidice* from Catania and Cyprus to show the range of aberration below.

SIRICIDS.—Mr. Edwards, the Siricids *Sirex gigas*, *S. juvenis* and *S. noctilio*.

DESTRUCTIVE INSECTS.—Messrs. R. Adkin and W. West, species of Lepidoptera and Coleoptera injurious to trees. Mr. Edwards, diagrams illustrating the life-history of *Hylesinus piniperda* (Col.) Mr. Main, lantern slides of details of various insects destructive of timber.

PAPER.—Mr. B. Adkin read a paper "Insects injurious to Forestry."

NEGLECTANCE OF AUTHORITIES.—A discussion followed, especial note being made of the negligence of the authorities in allowing the huge quantities of debris of the recent felling to lie so long and thus form convenient harbour for multitudes of insects and other pests.

June 12th.—NEW MEMBER.—Mr. J. A. Humphreys, of Hampstead, was elected a member.

HYBRID LARVÆ OF TEPHROSIA.—Mr. Mera exhibited bred melanic *Hibernia defoliaria*, with black females from Epping Forest from a melanic female; and living larvæ of hybrid *Tephrosia biundularia* *T. crepuscularia*, with larvæ of the first for comparison.

WICKEN FEN COLEOPTERA.—Mr. West, the beetles *Anthrenus terminatus* and *Georyssus pygmaeus* from Wicken Fen.

BOX HILL.—Mr. Ashdown, the beetles *Mordellistena abdominalis* ♀ and *Tetropium gabrieli* from Box Hill.

ABERRATION OF *M. CINXIA*.—Mr. Tatebell, a bred *Militaea cinxia*, destitute of markings on disc of forewings.

RHAPHIDIA.—Mr. Bunnett, a *Rhaphidia* sp. and the sawfly of the privet.

ABNORMAL SOLANUM AND CABBAGE.—Mr. Gadge, a variegated-leaf plant of *Solanum dulcamara*, and an abnormal growth of cabbage, having a small cup on a stem springing from the midrib of the leaves.

FASCIATED ASPARAGUS.—Mr. Edwards, for Mr. Dods, a wide fasciated stem of asparagus from Christchurch.

NEW AB. OF *P. AEGERIA*.—Mr. Sperring, bred *Pararge aegeria* v. *egerides* from Peterborough, with a large blotch of colour in the space between the apical blotch and the next in the series.

SEASONAL NOTES.—Seasonal notes were given by the members.

Subscriptions for Vol. XXXI. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 [This subscription includes all numbers published from January 15th to December 15th, 1919.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14.

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Ten Shillings, and must be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14. Cheques and Postal Orders should be made payable to H. E. PAGE.

ADVERTISEMENTS of Books and Insects for Sale, or Books wanted will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14.

Subscribers who change their addresses must report the same to Mr. H. E. PAGE "Bertrose," Gellatly Road, New Cross, London, S.E., otherwise their magazines will probably be delayed.

New Cabinets and Apparatus.—Note: Finest make only, and best material only used.

12, 20, 30 and 40 drawer Cabinets in polished deal or mahogany. Specifications and prices on application.

Standard make Store Boxes, 10×8, 5/6; 13×9, 7/-; 14×10, 8/-; 16×11, 9/-; 17½×12, 10/-; postage 6d. extra. Special price by taking 12 or more of one size.

Insect and Egg Cases, Jointed Nets, Pins (Tayler's), Zinc Collecting Boxes, Setting Boards, Killing Tins, etc., etc.

Write for complete lists of set specimens, apparatus, larvæ and pupæ.

LEONARD TATCHELL, Lepidopterist, 43, Spratt Hall Road, Wanstead, E.11.

Duplicates.—*A. immorata*, *P. affinitata*, *E. venustula* (4), *S. andrenaeformis* (7), *S. spegiformis* (3), *I. globulariæ* (4), *I. statices* (10), *E. miniata* (2), and others.

Desiderata.—*M. bombyliiformis*, *S. apiformis*, *S. craboniformis*, *S. formiciformis*, *S. ichneumoniformis*, *S. philanthiformis*, *S. chrysidiformis*, *L. pygmeola*, *L. muscerda*, *L. caniola*, *E. cribrum*, and many others.—*H. B. Sly, 45, Warrford Court, London, E.C.*

Duplicates.—Varleyata and other varieties of Grossulariata. *Desiderata.*—Good varieties and local forms. *Spilosoma urticae*, *Advenaria*, and other ordinary species to renew old series. Good Tortricæ and Tineæ.—*Geo. T. Porritt, Elm Lea, Dalton, Huddersfield.*

Duplicates.—Grossulariata var. *lutea*, *lacticolor*, *varleyata*, *fulvaticata*, etc. *Desiderata.*—Other extreme forms of Grossulariata, or good vars. of *Diurni*.—*Rev. G. H. Raynor, Hazleleigh Rectory, Maldon, Essex.*

Desiderata.—*Euchlœ cardamines* from Ireland; also types of *E. cardamines* from Switzerland, Italy, S. France; var. *turritis* (S. Italy), var. *volgensis*, var. *thibetana*, and of *E. gruneri*, *F. euphenoides*, *E. damone*, and any palaearctic species of the genus.

Duplicates.—*Loweia dorilis* and vars., a few minor vars. of *R. phlæas* (British), and many British lepidoptera.—*Harold B. Williams, 82, Fifeley Avenue, Stoke Newington, N.*

Duplicates.—*A. coridon* vars., including semi-syngrapha, *H. Comma. Desiderata.*—*A. coridon* var. *Albicans* (Spanish) and var. *Hispana* (do.), and good butterfly vars., especially from Ireland.—*Douglas H. Pearson, Chilwell House, Chilwell, Notts.*

Duplicates (all Clydesdale).—*Æthiops*, *Selene*, *Icarus*, *Phloxas*, *Hectus*, *Mundana*, *Perla*, *Fulva*, *Nictitans*, *Tritici*, *Chi*, *Boreata*, *Cambrica*, *Belgaria*, *Immanata*, *Olivata*, *Tristata*, *Boreata*, *Mercurella*, *Angustea*, *Dubitatis*, *Ambigualis*, *Truncicolella*, *Derepitalis*, *Kuhmella*, *Fusca*, *Margaritellus*, *Hortuellus*, *Hyemana*, *Phryganella*, *Ferrugana*, *Solan-drinana*, *Sponsana*, *Conwayana*, *Stramineana*, *Rivulana*, *Urticana*, *Octomaculana*, *Perlepidana*, *Vaccinana*, *Geminana*, *Herbosana*, *Myllenerana. Desiderata.*—Numerous, especially.—*A. A. Dalrymple, 7, Keir Street, Glasgow.*

Duplicates.—*Janira*, *napi*, *cardamines*, *Artemis*, *P. interrogationis*, *P. festucae*, *P. bractea*, *D. conspersa*, *Haslata* (all Irish). *Desiderata.*—*Machaon*, *Artemis* (English), *Cinxia*, *Athalia*, *Cardui*, *Galatea*, *Epiphron*, *Lucina*, *Actæon*, *Sylvanus*, *Comma*. All perfect, well set on black pins.—*Charles Langham, Tempo Manor, Co. Fermanagh, Ireland.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. 1919, Oct. 1st; Oct. 15th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—*Hon. Sec.*, Stanley Edwards, 15, St. German's Place, Blackheath, S.E. 3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society).—Hall 20, Salisbury House Finsbury Circus, E.C. The First and Third Tuesday in the month, at 7 p.m. Visitors invited. *Hon. Sec.*, J. Ross, 18, Queens Grove Road, Chingford, N.E.

All MS. and editorial matter should be sent and all proofs returned to **HY. J. TURNER**, 98, Drakefell Road, New Cross, London, S.E.14

We must earnestly request our correspondents *NOT to send us communications identical with those they are sending to other magazines.*

Lists of **DUPLICATES** and **DESIDERATA** should be sent direct to **Mr. H. E. Page**, Bertrose, Gellatly Road, New Cross, S.E. 14

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.

Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

G. A. Bentall, F.Z.S.,

~ NATURALIST. ~

Carton Store Boxes. $15\frac{1}{2} \times 10\frac{1}{4} \times 2\frac{1}{8}$ ", wood sides, hinged lids, covered dark leather paper, lined white inside, cork bottom. 3s. 9d. each.

Whitewood Double Store Boxes. Lined top and bottom cork Napthaline cell.

$10 \times 8 \times 3$ "	$14 \times 10 \times 3$ "	$17 \times 12 \times 3$ "
7s. 9d.	9s. 6d.	10s. 9d.

Stained and polished Mahogany colour.

10s. 9d.	12s. 6d.	14s. 9d.
----------	----------	----------

Also stocked in Walnut same price as Whitewood.

Whitewood Travelling Setting Houses. $16 \times 12 \times 4\frac{1}{2}$ ", binged ends and lid, perforated Zinc both ends. 13s. 6d. each; setting boards extra.

Superior Oval Cork Setting Boards. 14 inches long.

$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4ins.
6d.	7 $\frac{1}{2}$ d.	1s.	1s. 3d.	1s. 4d.	1s. 6d.	2s.	2s. 3d.	2s. 6d.
								3s.

40-drawer New Entomological Cabinets, with Mahogany panel doors, £85 each.
Full specification of same can be supplied.

Cork Sheets—

$11\frac{1}{2} \times 3\frac{1}{2} \times \frac{3}{8}$ "	$11\frac{1}{2} \times 3\frac{1}{2} \times \frac{3}{16}$ "	$11\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{4}$ "
2s. 0d. doz. sheets.	3s. 6d. doz. sheets.	4s. 6d. doz. sheets.

Kirby Beard's Entomological Pins—

Size	1	3	5	8	10
White	1s. 3d.	1s. 3d.	2s. 0d.	2s. 9d.	3s. 9d. per oz.
Black	2s. 6d.	2s. 6d.	3s. 3d.	3s. 9d.	5s. 0d. do. do.

Strong Glass Killing Jars, fitted with cork, 2s. each; larger size, 2s. 6d.

Pine Breeding Cages for low feeding larvae $16 \times 12 \times 7\frac{1}{2}$ ", with perforated zinc lid. 10. 6d. each.

Round Chipette Boxes, very strong—

$1\frac{1}{2} \times 1\frac{1}{2}$ "	$1\frac{3}{4} \times 1\frac{1}{4}$ "	$2 \times 1\frac{1}{4}$ "
3d. doz.	4d. doz.	5d. doz.

Round White Metal Boxes—

$1\frac{1}{2} \times \frac{3}{4}$ "	$2 \times \frac{3}{4}$ "	$2\frac{1}{4} \times 1\frac{1}{8}$ "	3×2 "
6d. doz.	7 $\frac{1}{2}$ d. doz.	8d. doz.	1s. 9d. doz.

Strong Canvas Bag for Larvae Collecting, Sallows, etc. 17×30 ". 2s. each.
Pattern of material sent post free.

Folding Brass Adjustable Pocket Net with Screw, to fit any stick. 6s. 9d. each.

Tracing-Paper for Setting Insects. 20×30 ". $3\frac{1}{2}$ d. sheet; samples free.

White Tiffany (soft finish) for Sleaving, etc. 30" wide. 10 $\frac{1}{2}$ d. yard; samples free.

Blue Steel Glass-headed Pins. $1\frac{1}{2}$ " long, for setting with tracing-paper. 6 $\frac{1}{2}$ d. box of 4 doz. pins.

Price Lists, post free, on request.

DUDLEY HOUSE, SOUTHAMPTON ST. (opposite Hotel Cecil),
STRAND, W.C. 2.

The Entomologist's Record

AND

Journal of Variation

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.

GEORGE T. BETHUNE-BAKER,

F.Z.S., F.L.S., F.E.S.

M. BURR, D.SC., F.Z.S., F.L.S., F.E.S.

(REV.) C. R. N. BURROWS, F.E.S.

(REV.) GEORGE WHEELER, M.A., F.E.S.,

and

HENRY J. TURNER, F.E.S.,

Editorial Secretary.

T. A. CHAPMAN, M.D., F.R.S., F.E.S.

JAS. E. COLLIN, F.E.S.

H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

JOHN HARTLEY DURRANT, F.E.S.

ALFRED SICH, F.E.S.

CONTENTS.

	PAGE.
The Larvæ of <i>Hydroecia crinanensis</i> and that of <i>Apamea leucostigma</i> (fibrosa), <i>Rev. C. R. N. Burrows, F.E.S.</i>	177
Seasonal Polymorphism and Races of some European Grypocera and Rhopalocera, <i>Roger Verity, M.D.</i>	178
NOTES ON COLLECTING:—A Note from a Correspondent in Sweden, <i>H.J.T.</i> ; The Druce Collection; <i>Silpha atrata</i> , L. with Abnormal Antennæ, <i>G. B. C. Leman</i> ; A new County Record for <i>Zeugophora flavicollis</i> , Marsh, <i>Horace Donisthorpe</i> ; Notes on Entomology in France and Italy in 1918 (continued), <i>E. B. Ashby</i> ; <i>E. neri</i> at Eastbourne, <i>S. A. Chartres</i>	184
CURRENT NOTES AND SHORT NOTICES	188
SOCIETIES:—The South London Entomological Society	191
SUPPLEMENT:—The completion is still held over.	

OCTOBER 15th, 1919.

Price ONE SHILLING (NET).

Subscription for Complete Volume, post free

(including all DOUBLE NUMBERS, etc.)

TEN SHILLINGS.

TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,

"BERTROSE," GELLATLY ROAD, NEW CROSS, S.E.14.

Communications have been received or have been promised from Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, C. P. Pickett, Parkinson Curtis, H. Donisthorpe, A. Sich, Dr. Verity, C. W. Colthrup, Rev. C. R. N. Burrows, Dr. T. A. Chapman, Capt. Burr, G. T. Bethune-Baker, E. B. Ashby, P. A. H. Muschamp, J. H. Durrant, Orazio Querci, Rev. F. D. Morice, G. B. C. Leman, C. Nicholson, H. P. Riviere, with Reports of Societies and Reviews.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/5, 2/2, 2/6, 3/2. Folding Nets, 3/9, 4/3, 4/9. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 7d., 10d., 1/2, 1/10. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/4. Nested Chip Boxes, 9d. per four dozen, 1 gross, 2/-. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/7 per tin. Store-Boxes, with camphor cells, 2/3, 2/9, 4/-, 4/6, 5/6, 6/8. Setting-Boards, flat or oval, lin., 6d.; 1 1/2 in., 8d.; 2 in., 10d.; 2 1/2 in., 1/-; 3 1/2 in., 1/4; 4 in., 1/6; 5 in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 10/6, 12/9; corked back, 15/9. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/9, 4/6, 5/6, 8/3. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/9 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3 1/2, 1/2 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/6. Glass-top and Glass-bottomed Boxes, from 1/3 per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d., 1/-; Blowpipes, 4d., 6d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lépidoptera, etc., as well as minute insects of all other families and for all insects liable to become greasy.

We stock various sizes and lengths of these Silver Pins which have certain advantages over ordinary entomological pins (whether enamelled black or silver or gilt).

NESTING BOXES of various patterns which should be fixed in gardens or shrub berries by lovers of birds before the breeding season.

SHOW ROOM FOR CABINETS

Of every description for INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS &c.

Catalogue (84 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).
Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTEEN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.

Bexley]

L. W. NEWMAN

[Kent

Has for sale a superb stock of 1918 specimens in fine condition, including Varleyata; Bicuspis; Pendularia var. Subroseata; Melanic forms Lariciata, Consortaria, Consonaria, Abietaria; Irish forms Aurinia and Napi, fine vars. Tiliae, Yellow Dominula, etc., etc. Quotations and Insects sent on approval with pleasure.

Also a huge stock of fine PUPÆ and OVA.

Write for latest price lists.

NOTICE:—Owing to huge rise in cost of metal, etc., my **Relaxing Tins** are now **3/6** small and **5/6** large, post free.

GALLS AND PIERCED BRAMBLE AND BRIER STEMS.—MR.

L. A. BOX would be very grateful for any sorts and quantities, with localities, from all parts of the United Kingdom.
80, Northampton Road, Croydon.

The larvæ of *Hydroecia crinanensis* and that of *Apamea leucostigma* (fibrosa).

By REV. C. R. N. BURROWS, F.E.S.

On June 26th, 1919, I received from Mr. L. A. E. Sabine eight larvæ taken from within the leaf stems of *Iris pseudacorus* in Co. Sligo. It will be remembered that last year Mr. Sabine found the larvæ of *Hydroecia crinanensis* feeding in the interior of Iris stems and his discovery was duly reported in our Magazine for January last, at page 12. This account is so complete that it requires no further enlargement.

These eight larvæ sent by Mr. Sabine this year were taken under the same conditions, but he took a larger number and was able to send me some for description. I felt scarcely capable of so delicate a business but determined to do my best. I soon found that it would be difficult. The larvæ were filthy in their habits. The soft, semi-liquid *Iris* pulp seemed to be merely chewed, or passed unchanged through the body. The larvæ would not remain still, and when I sought to restrain them bit my fingers fiercely. So I, in desperation, blew them! This done I felt certain that I was dealing not with one species, but with two. I had up to this point supposed that I had before me the same larvæ, but perhaps in different stages, for it was evident that some at least were not full grown. Now I felt myself in a difficulty, which however was quickly relieved by the receipt of a letter from Mr. Sabine beseeching me to bestow special care upon the "dark" larvæ as they were not *H. crinanensis*, but some different species and he had found only one more than the four he had sent to me. I wrote "by return" confessing what I had done. He searched diligently and found a few more of these strangers—which in the end proved to be *Apamea leucostigma*. I need scarcely say that two pupæ of *H. crinanensis* which I handed to Mr. Mera in due course produced *H. crinanensis*.

The next business was to get the larvæ reliably described. This I felt unequal to doing. So I called in the help of my old and valued friend, Mr. A. W. Bacot, who amongst other abilities retains that of describing lepidopterous larvæ.

Mr. Sabine supplies me with the life descriptions which are necessary to complete those of blown specimens.

H. crinanensis.—"To me the colour of *crinanensis* larvæ seems to be greyish-white (sometimes tinged with pinkish or more rarely with purplish) with distinct pinkish longitudinal bands. When nearly full fed the pinkish colour becomes much duller and fainter, the greyish white ground colour predominating more."

A. leucostigma.—"The ground colour is reddish brown with very faint whitish lines.

Mr. Bacot sends me the following reports:—

"Note on the differences observed in structure and markings between blown specimens of the larvæ of *Hydroecia crinanensis* and *Apamea leucostigma* in their penultimate skins."

H. CRINANENSIS.

"Markings.—Ground colour pale whitish-grey with two broad dusky dorsal bands, darker in shade, but approximately the same hue as the ground colour. These dorsal bands are separated by a median band of the ground colour of about the same width. There is a narrow
OCTOBER, 1919.

interrupted sub-dorsal streak, and a broad lateral band of the same hue as the dorsal band."

"Head and plates.—Head of a bright pale glistening brown. Prothoracic plate of the same colour and surface as the head, but boldly edged with black. Anal plate convex, of the same colour as the prothoracic, but with a rough granulated surface, the black edging being broken into a series of dots on the posterior margin of the plate."

"Tubercles.—The tubercles at the base of the body hairs are enlarged into flat chitinized skin plates coloured black, which stand out in strong contrast to the pale skin. I. and II. are set in the usual trapezoid position on the first to seventh abdominal segments, in a single transverse line on meso- and meta-thoracic segments and at the corners of an oblong on the eighth abdominal segment. Laterally III. IV. and V. are set in close proximity to the black-rimmed spiracles, V. having a much enlarged basal plate. The setae are pale brown, slender, and tapering."

A. LEUCOSTIGMA.

"Markings.—The dark bands of *H. crinanensis* are so exaggerated in this species that they practically form the body colour of the larva, the pale areas being reduced to a narrow median streak and sub-dorsal line. No lateral markings are clearly distinguishable on these preserved larvæ."

"Head and plates.—The head is dark chocolate-brown, both the prothoracic and anal plates being equally dark. The black edging which was a feature of these plates in the former larva being hardly noticeable in this species. The anal plates of the three specimens appear heavier than those of *crinanensis*, and are *concave* instead of *convex*, suggesting a more purely internal habit of feeding."

"Tubercles.—Both tubercles and setae seem to be identical with those of *crinanensis*, except that the plates at their bases appear to be more heavily chitinized."

With Mr. Sabine's consent I purpose depositing specimens of these larvæ at the British Museum.

Seasonal Polymorphism and Races of some European Grypocera and Rhopalocera.

By ROGER VERITY, M.D.

(Continued from page 129.)

Apatura ilia, Schiff., form LUTEISSIMA, mihi. A male specimen from Düsseldorf (Prussia), in my collection is so remarkable that I deem it necessary to name it; it is very similar to the female which Oberthür figures in *Ét. Lép. Comp.*, III., fig. 127, under the name of *laura*, Lepell.; this is only a slight increase of the characters of female *eos*, Rossi (this name was given Ernest and Engramelle's figure in *Pap. d'Europe*, which Rossi observed corresponded very well with the Tuscan specimen), due to the outspread of the fulvous colouring, but in the male sex such an appearance is quite unusual, and no author, to my knowledge, has as yet mentioned it: the entire surface of the wings is fulvous and the black pattern consists only of the cellular spots on the forewings and of a row of round spots on the hindwing;

a faint trace of the premarginal band can be perceived on the former, but all the rest of the darker pattern is suppressed; the violet sheen is very inconspicuous for want of a dark background.

Charaxes jasius, L., race *septentrionalis*, Vrtý., first gen. BREVICAUDA, mihi. The spring brood has shorter and thicker tails than the summer one.

Limenitis camilla, L. (= *sibilla*, L.). The discovery of this species as far south as Southern Italy is noteworthy. Hitherto only two colonies were known in Italy, near Turin and between Pisa and Leghorn. The Quercis have now collected it at the beginning of July, 1919, near Atina, 500m., in the Mainarde Mts. It belongs, as do the other Italian colonies, to the race *angustefasciata*, Streckf.

Limenitis rivularis, Scop. (= *camilla*, auctorum nec L.). There exists in Tuscany a very marked seasonal polymorphism. Except for very few individuals, the three broods belong respectively to *reducta*, Stögr., to the probable nymotypical form (with variation to the very large *herculeana*, Stichel), and to *prodiga*, Frhst., all of which had been described as local races; this, of course, may be in some regions, but evidently needs confirmation.

Melitaea didyma, Esp., first gen. RUBIDA, mihi; race NIGRORUBIDA, mihi; race SUBRUBIDA, mihi; race SUBALPINA, mihi; race *mauretanica*, Obth., second gen. OCCASUS, mihi; race PALUSTRIS, mihi; race APENNINIGENA, mihi.

The geographical, seasonal, and individual variations of this species are most fascinating and instructive. Unfortunately their nomenclature has been set down from the beginning in such a faulty and indefinite way that it has paralysed all subsequent attempts to draw from it a clear sketch of the facts. First of all it must be noted that the specific name and description are always ascribed to the wrong author, Ochsenheimer. Kirby alone attributes it rightly to Esper, but even he has not gone far back enough and stops short at Part I., vol. 2, p. 63, pl. lxi., fig. 2 of the "Schmetterlinge," where Esper figures a "*didymae* var.," quite overlooking vol. 1, p. 365, pl. xli., fig. 3, where the first description and explanation of the name really are; the latter figure represents quite clearly, though roughly, a female of the summer brood from Uffenheim in Franconia; the pattern of the underside of the forewings is slightly aberrant, but I possess some Tuscan specimens that come very near it; two of the central row of black dots are transformed into a minute dot with a circle round it; Esper explains that these twin circles and the twin circles which can normally be perceived in the cell of the wings above, made him give the name of the twin sister of Apollo to the species. Having thus established that the nymotypical form is the small, ochreous summer one, we are led to conclude that the more abundant, large, fox-coloured form of the first brood has actually remained to this day without a name. I suggest calling it *rubida*, taking as typical Esper's figure 1 on pl. lxi., drawn from a French specimen, probably Parisian. In Central Europe there is, however, more than one race, and I have two others in my collection. One, from Saxony, has a very

extensive black pattern, so that it corresponds amongst the races of Central Europe to *græca*, Stdgr., amongst those of Southern Europe: the marginal band is very wide and so are the premarginal lunules, thus leaving only a row of very thin fulvous lunules between them; the median series of black spots is very large and the basal pattern is well developed also on the hindwings; the female is quite similar to the male, but with the black pattern still more diffused and more shaded in outline; I should call it *NIGRORUBIDA*. The opposite extreme of variation is seen in a series from Berlin, which gives the general impression of being transitional to the southern races; it is smaller and of a brighter fulvous; black pattern very variable in extent, some specimens approaching the preceding, others coming nearer the darkest individuals of the southern *protea*, Vrtý., from which they chiefly differ on account of the bolder black pattern of the underside and fulvous bands of a deeper tone; it might be called *SUBRUBIDA*. My series from Geneya may be ascribed to the same race, though the darker specimens are wanting and more of the lighter-form are seen. Amongst the Alpine *didyma* at least two races are clearly discernible: the darkest one is *alpina*, Stdgr., with the forewings of the female uniformly grey or greenish-grey, and the hindwings often of the same colour, except the costal area. This description could in no way be applied to races of other Alpine localities, such as those of Susa and Bardonecchia in my collection: the grey ground-colour does not exist at all; it is fulvous, usually pale and sometimes nearly white; the black pattern is very extensive, but it stands out distinctly and it is sharply outlined, instead of shading off as in *alpina*; the size is usually smaller than in the latter and the wings are more elongated and narrower; I propose the name *SUBALPINA*.

In the southern group of races one finds a considerable degree of confusion in nomenclature. A few old names are used all round and given different meanings, because their original descriptions are so indefinite that each author has found he could fit them to the material he had at hand, and no one has attempted to work out the much more complex variation existing in reality. Thus, the form *occidentalis*, Stdgr., is simply described as being "of a more diluted fulvous colour." The result is it has always been applied to the ochreous form of the second brood. But the name was given by Staudinger to Hübner's figures 869 and 870, which represent a highly characteristic form of the first brood from South Russia and Central Asia, transitional to *caucasica* and *neera*, as stated by Staudinger in his description of the former. It is of a very bright fox-red colour, much lighter than the deep red of the German *rubida*, and thus justifies Staudinger's description, although in quite a different way from the usual interpretation of ochreous. Rühl is the only author who has understood Staudinger correctly. Seitz figures a pair, which evidently belong to the African second brood. Oberthür [*Ét. Lép. Comp.*, III., p. 242; X., fig. 2299-2302] figures the African *didyma* under the name of *mauretunica*, including the two generations; I should restrict this name to fig. 2301-2 of the first brood, and give the name *OCCASUS* to the second, taking the other figures as "types"; this is also Seitz's figures of *occidentalis*: the large size of the median row of black spots is the distinguishing character of African races, transitional to *deserticola*,

Obth. Another name which has often been misapplied is that of *persea*, Koll., used for very small ochreous European specimens of *didyma*; *persea* is too definite a race, with many characters of its own, for small size to be given primary importance; Persian specimens are often comparatively large; the European dwarfs expanding less than 30mm. might be called *pumila*, if necessary. The names *dalmatina*, Stdgr., and *romana*, Calb., are anything but synonyms of *persea*, as stated by Staudinger, and should be used for the second generation of Southern Europe, which differs most constantly and markedly from the first by its small size and ochreous or yellowish fulvous colouring; many specimens are identical with Esper's *didyma*. The name *meridionalis*, Stdgr., has until now been applied to all the *didyma* of Southern Europe, as if they all were alike; there exist on the contrary several very distinct races. Staudinger's "types" were from the Parnassus in Greece, but he also quotes Sicily as a locality; this is quite correct, for there exists there a small race quite different from the other Italian ones, and answering his description perfectly; the forewings and sometimes the hindwings of the female are usually entirely of a uniform grey or greenish-grey, light enough to show off the black pattern, which is very limited in extent; when the grey scaling is absent, which occurs very rarely, the ground colour is nearly white (♀ form *albescens*, Vrtz.) In the *Bull. Soc. Ent. Ital.*, xlviii., p. 184 (1916), I have described the race of Central Italy from Tuscan series and called it *protea*; the races of southern France and Spain, except the southern portion, where *mauretanica* occurs, seem similar to it. It is very variable, but quite different from *meridionalis* by its large size, bolder pattern, variable ground colour in females, which is never of a uniform grey, etc. The original *graeca*, Stdgr., was from the valley of Karpanisi, but specimens with nearly as extensive a black pattern in the males occur also amongst the Sicilian *meridionalis*, showing the two races are closely connected; they never occur in *protea* or other races, though these are in some localities, on the whole, darker than *meridionalis*. In the marshes of the mouth of the Arno I have found a race with an extensive black pattern in both sexes and the female as grey as *alpina*, standing to *protea* as *graeca* stands to *meridionalis*; I propose naming it *PALUSTRIS*. There is also in Central Italy a mountain race of the Apennines corresponding to *alpina* of the Central European group of races; melanism is never as marked as in the latter, the ground colour in the female is never as white and the underside-pattern is not much more extensive than in *protea* or *meridionalis*; the male too is quite of the southern form; I call it *apenninigena* from a series from Prato Fiorito, 1000 m. above Lucca. I can only mention here the gigantic *patycosana*, Turati, of the Calabrian coast, and *neeraeformis*, Vrtz., of the high altitudes of Aspromonte, which alone in Italy and in the W. shows several oriental characters, wings elongated, females of a whitish fulvous with black pattern not extensive, underside-pattern on the contrary very bold and bright, as in *neera*, F. d. W.

The variations of *didyma* in Europe and Africa can be summarised as follows in a tabular form; a few of the races of W. Asia more closely connected with them are mentioned. It will be seen that groups of races with characters in common correspond to geographical

areas; in each group the extent of the black pattern increases from left to right:—

	a.	b.	c.	d.	e.
A. Central Europe.	<i>armoricana</i> , Obth. [II. gen. <i>didyma</i> , Esp.]	<i>subrubida</i> , Vrty.	<i>rubida</i> , Vrty.	<i>alpina</i> , Stdgr. <i>subalpina</i> , Vrty.	<i>nigrorubida</i> , Vrty.
B. Southern Europe.	<i>bosphorana</i> , Culot. [II. gen. <i>romana</i> , Calb.] [<i>dalmatina</i> , Stdgr.]	<i>meridionalis</i> , Stdgr.	<i>protea</i> , Vrty.	<i>apenninigena</i> , Vrty.	<i>graeca</i> , Stdgr. <i>palustris</i> , Vrty. <i>patycosana</i> , Trti. <i>neeraefor- mis</i> , Vrty.
C. Africa and Southern Spain.	<i>deserticola</i> , Obth. [II. gen. <i>oc- casus</i> , Vrty.]		<i>mauretanica</i> , Obth. <i>abyssinica</i> , Obth.		
D. Southern Russia and W. Asia.	<i>perseae</i> , Koll. <i>robertsi</i> , Btl. <i>lilliputana</i> , Obth.	<i>neera</i> , F. d. W.			<i>caucasica</i> , Stdgr.

- A. Black pattern equally extensive on the whole surface of fore- and hindwing and on both surfaces; male of a deep fox-red from group *c* to *e*.
- B. Tendency to lesser extent of black pattern in basal and median portion of hindwing and on underside; these characters do not exist in group *e*; the male is deeply coloured only in part of group *e*; otherwise always of a more or less light bright fulvous.
- C. Tendency to lesser extent of black pattern in the basal and in the exterior portion of fore- and hindwing on upper-side.
- D. Tendency to lesser extent of black pattern in basal and median portion of fore- and hindwing; tendency to elongated and acuminate wings as in most Asiatic races.

N.B.—The characters mentioned above become more and more marked from *e* to *a*.

- a.* Races of the more arid localities; frail; all the black pattern of upper-side very reduced and ground-colour pale ochreous; sexual dimorphism very inconspicuous. All the second generation.
- b.* Black pattern nearly entirely obliterated in basal portion of hindwing on upper-side and in a general way more extensive than in *a*, less so than in *c*.
- c.* Black pattern visible on the whole surface of the wings on upper-side.
- d.* Mountain races, with extensive black pattern, especially in female, producing marked sexual dimorphism.
- e.* Races of damp localities, large and robust, with black pattern more extensive in male, often less so in female than in *d*.

Melitaea phoebe, Knoch, race *TUSCA*, mihi and second gen. *PAUPER*, mihi or *EMIPAUPER* mihi; race *NIGROALTERNANS*, mihi; race *MONILATA*, mihi; race *EMIPUNICA*, mihi. This species, like the preceding, produces very marked individual, seasonal, and geographical variation, but in this case the races do not form groups corresponding to their

distribution ; they are local, and even the extreme types may be found in localities not far apart. If they be tabulated so that the extent of the black pattern increases from above downwards and the deepness or the brightness of the fulvous ground-colour increases from left to right, they fall as follows :—

A.	B.	C.	D.	E.
[II. gen. <i>pauper</i> , Vrty.]				
<i>ogygia</i> , Frhst.				
<i>telona</i> , Frhst.		<i>aetherea</i> , Ev.		<i>emipauper</i> , Vrty. <i>tusca</i> , Vrty.
	<i>ornata</i> , Christ. <i>occitanica</i> , Stdgr.		<i>phoebe</i> , Knoch. <i>monilata</i> , Vrty.	
<i>emipunica</i> , Vrty.				
				<i>caucasicola</i> , Vrty.
<i>punica</i> , Obth.	<i>alternans</i> , Seitz. <i>nigroalternans</i> , Vrty.			

A. Pale ochreous ; B. Very pale fulvous alternated with deep reddish fulvous ; C. Pale fulvous ; D. Fulvous ; E. Deep reddish fulvous or very bright ditto.

The race of Central Italy differs from that of Central Europe in having generally a much brighter and warmer ground-colour, although in the extreme males it varies from deep chestnut to light fulvous ; the black pattern is much lesser in extent and in some specimens very reduced indeed ; the race by these characters comes near *aetherea*, Ev., of S. Russia, but is brighter and never so large ; a few individuals of the first gen. are, however, quite similar to it and might be called *AETHEREAIFORMIS*, as they contrast with the rest by their dull ground-colour and very reduced black pattern ; such is specimen N. 2 of my series from Florence. The second brood of this locality is one of the most distinct forms of the species and would alone justify its being separated as a race ; whereas the first brood measures 35-38mm. in expanse in the male and 40-42mm. in the female, the second only measures 29-34mm. and 33-37mm. respectively ; the narrow, elongated and acuminate wings give it a still smaller and frailer look, distinguishing it from *ogygia*, Frhst., of Greece, and *telona*, Frhst., of Syria, which it otherwise resembles by its very pale ochreous ground-colour and by the extremely reduced extent of the black pattern ; it must also be noted that the types of both belonged to the first brood. In some localities in Tuscany the seasonal dimorphism is distinctly less marked, the second brood being intermediate between those just described. I should call the race *tusca* and the second brood *pauper* or *emipauper* respectively. Individuals with marked black dots across the hindwing above, as in *cinxia*,* might be called *cinxioides* ; in Tuscany they are found in 6% of the males and 50% of the females, thus being probably a recessive character.

In some Alpine valleys, such as at Bard (Mont Cenis), wherefrom I possess it, a really magnificent race is found, which is like *alternans*, Seitz, on account of the alternately pale yellow and deep mahogany-

* It was so named by Muschamp, *Bull. Soc. Lep. Genève* (1905), I. p. 69, pl. i. fig. 3.—[G.W.]

red ground colour, but in which the black pattern is so enormously extended as to make *phoebe* nearly unrecognisable; one of my female specimens is identical with Seitz's figure of female *changaica* in "Grossschmett. der Erde," but a little smaller; I propose naming it *nigroaltermans*.

The race of the Valais is distinguished from nymotypical *phoebe* by a slight but constant character: a marked increase in size of the central row of black spots across the wings, as compared with the extent of the black pattern generally: race *monilata*; types, collected by Wullschlegel, in my collection. In *tusca* and other races the same character appears in single individuals, and in such cases they might be called *MONILATAEFORMIS*, as by other characters they naturally differ from the Valais specimens. The opposite variation is not rare in the female of *tusca*: here nearly all the black pattern, except the marginal streak and the premarginal lunules, is entirely obliterated or vaguely shadowed (form *DELETA*, mihi; type: my spec. no. 57).

Finally, the Sicilian race deserves more attention than it has hitherto received; it is a transition to Oberthür's *punica*, which he considered as being probably a distinct species, evidently wrongly. Males: 31-37 mm.; females: 37-38 mm.; wings short and broad; ground colour often pure yellow or only slightly reddish; black pattern thin, but quite complete, giving the impression of an even network and much less variable than in other races; the females have at the base of the wings a very extensive greenish-grey suffusion, such as is never seen in other *phoebe*, but identical in colour to that of Sicilian *didyma* of that sex; on the underside the black pattern often is as distinct as in *punica*, and always more than in *tusca*; the white spaces often have the characteristic porcelain-glaze look of the former. I call this race *emipunica*; types collected in May at S. Martino delle Scale and other localities near Palermo.

The name *caucasica* of Staudinger had already been used by that author for a race of *didyma*; it might be replaced by *CAUCASICOLA*.

(To be continued.)

NOTES ON COLLECTING, Etc.

A NOTE FROM A CORRESPONDENT IN SWEDEN.—The following is an extract from a letter written to my friend, Mr. E. Step, from near Stockholm, by Mr. Bassett Digby, F.R.G.S., F.Am.G.S.:—"Funny how in England we coddle up our bred *Papilio machaon* and seem to think them fragile folk. Why up here in the latitude of Petrograd and northern Labrador, I find the imago and fat and care-free larvæ pretty numerous on and around isolated plants on stony beaches of rocky islands out in the Baltic, that for nearly half the year are icebound and snowed under. Is this news to you? They seem, by the way, very keen on the beaches; hardly ever occur inland on the islands. I have found the larvæ on plants actually growing in the water with salt waves always lapping round the base. Presumably they have to acquire a sort of seafaring knack of hitching up their slacks and holding tight in stormy weather, when the stems must sway alarmingly. And we get on some islands a glorious big 'copper,' who looks like our extinct 'large copper' of Huntingdon. He seems very sluggish and clings to flowery patches of swampy meadow just

around his foodplants. In the same meadows are five-spot burnets, which oddly enough are much commoner than the 'six-spots,' which, indeed, I have never found. The 'five-spots' are often plentiful. Tons of 'pine-hawks,' some 'large elephant hawks,' and an occasional beast who I think is the 'Convolvulus,' come to honeysuckle and meadow-sweet." In another paragraph the writer expresses the pleasure he experienced some years ago in a visit to the Annual "Exhibition of the South London Entomological Society at some rooms at the other end of London Bridge," and after referring to a very fine series of the "peppered moth" exhibited on that evening (in 1909 by R. Adkin) he goes on to say: "If you ever come to Sweden, make a point of seeing a most interesting comparative series of the Apollo butterfly, showing his variations from Lapland to the Caucasus, and from Manchuria to Spain. It is the natural history museum at Frescati, a few miles north of this town." (Saltsjobaden).—H.J.T.

THE DRUCE COLLECTION OF LYCÆNIDÆ AND HESPERIDÆ.—This well-known and important Collection has recently come into the possession of Mr. J. J. Joicey, and is now at the Hill Museum, Witley. This collection was made by Mr. Hamilton H. Druce, who is well-known as one of our greatest authorities on the *Lycaenidae* and *Hesperiidae*. A great many of the types of the species described by Mr. Druce, as well as many of the types of Semper, are contained in the collection. Entomologists desirous of comparing with any specimens in this collection are invited to write to the Curator, The Hill Museum, Witley, Surrey.

SILPHA ATRATA L. WITH ABNORMAL ANTENNAE.—At Godalming (Surrey), in July last, I took a specimen with an additional (12th) joint on the right antenna, from the 3rd joint of which has outgrown a short spur with 5 joints. Mr. Donisthorpe tells me this form of abnormality is not uncommon so far as the spur is concerned, but it may be of interest to record this specimen owing to its having the extra joint.—G. B. C. LEMAN, Putney.

A NEW COUNTY RECORD FOR ZEUGOPHORA FLAVICOLLIS, MARSH.—On Sept. 8th I visited Brickett Wood, Hertfordshire, for a few days collecting; Mr. C. J. Gimmingham having kindly told me where I could find *Byctiscus populi* L. Beetles on the whole were very scarce, and ants quite off, probably on account of the very hot weather. The *Byctiscus*, however, was very plentiful on aspens, varying much in size, the largest specimens always proving to be males. *Zeugophora spinicollis* F., was also very abundant on the aspens. On account of this, the large number of aspen trees and shrubs in the locality, and the uselessness of general collecting, I determined to see if the much rarer *Zeugophora flavicollis* Marsh could not be obtained. After a great deal of hard work I was successful; one or two specimens of the beetle being beaten each day. I found that *Z. flavicollis* occurred on the older and taller aspens, whereas *Z. spinicollis* was more abundant on the younger and smaller trees and shrubs. Fowler records it as very rare, and gives the following localities:—Bexley and Ashford, Kent; Kimpton, Hants.; Seal Wood, Leicestershire; Manchester district, Kendal. In the supplement we give the additional locali-

ties :—Wimbledon Common, Epping Forest, New Forest, Colchester, and Suffolk. It may be worth recording that *Galérucella viburni* was rather plentiful on the aspens. This is curious as its proper food plants are, of course, *Viburnum opulus*, and more rarely *V. lantana*.—HORACE DONISTHORPE.

NOTES ON ENTOMOLOGY IN FRANCE AND ITALY IN 1918 (*continued from page 172*).—June 30th.—This afternoon I visited the little lane behind the Villa Pisano and found females of *G. rhamni* just emerged. The females of *Epinephele jurtina*, which were crowding the blossoms of the blackberry, *Rubus fruticosus*, have a marked tendency towards the var. *hispulla* by the prominence of fulvous colouring. *T. acteon* was, as usual, very active, and the males of *D. paphia* were conspicuously brilliant. The males of *Thecta acaciae* were flitting around the flowers of the Italian acacia, and *Syntomis phegea* was now in such swarms as to constitute a pest.

July 2nd.—This afternoon the lane produced a fresh specimen of *Satyrus circe*, and I noted that *T. acteon* seemed to prefer flying among the sword-grass. On the flowers of the *Clematis* just now both sexes of *C. w-album* were swarming. I was shown a kingfisher to-day which had been obtained by the river.

July 4th.—I went up the light railway until the tunnel was reached, when I turned to the right up the gorge past the big rocks, and collected on the green sward in view of the first waterfall. *Colias hyale* was very abundant here, and settled on odd plants of clover. The males of *Satyrus cordula* flew slowly about the rocky ground, frequently settling to avoid the gusts of wind. *G. rhamni* was flying up and down the stream, and *A. paphia* fed freely on the bramble blossoms. Crossing the stream I ascended by the path leading to the second waterfall. Here, where the stream crosses the path, several males of *Argynnis cydippe* (*adippe*) were settling on the soft, damp earth on the stream side. They were var. *cleodora*, which is the prevailing form here. A little further this species was swarming at the blossoms of *Scabiosa columbaria* and bramble. Going up the hill I returned to Arquata by another route via Rigoroso.

July 5th.—The hillside beyond the last villa, off the main road to the right, was visited to-day. Along the paths leading to and around the quarries, *C. hyale* was fairly frequent, and I noted for the first time the males of *Polyommatus meleager* in some number, and on the way back I took two *Anthocharis simponia*.

July 10th.—Instead of going along to the quarries I to-day climbed the steep hillside, and there in a small clearing the males of *Brenthis dia* were fresh on the wing. It was now too hot to stay long in the sun in the mid afternoon, even with a sun helmet on, so collecting is getting daily more curtailed. *L. arion* flies to and fro enjoying the torrid heat, as do *S. pruni*, *C. w-album*, and *T. ilicis* as they flit from leaf to leaf and branch to branch.

July 11th.—I again went up the gorge to the right, but went at once past the little cemetery up the path between the hills for some considerable distance. Near the stream I found *M. parthenie* in some abundance and both sexes of *Loweia dorilis* quite fresh on the wing. Males of *A. coridon* were still emerging. The form here is rather striking with a fine dark border, on the forewings especially. Last night the following species came to light—*Arctia villica*, *Malacosoma*

neustria, *M. castrensis*, *Xylophasia monoglypha*, *Apamea secalis* (*didyma*), *Dipterygia scabriuscula* (*pinastri*), *Toxocampa lusoria*, *Phragmatobia fuliginosa*, *Agrophila trabealis* (*sulphuralis*), *Thamnonoma vanaria*, *Geometra vernaria*, *Phigalia pedaria* (*pilosaria*), and the beetle *Polyphylla fullo* (male).

July 13th.—A specimen of the large beetle *Tanica textor* was given me by Mr. J. L. Denison. Though this fine beetle occurs throughout N. Italy I had not seen it before. Between the Villa Pisani and Arquata there is a row of trees on either side of the road, at first lime and then acacia trees. Every day on the trunks of these trees butterflies, beetles, and flies of all sorts settle and absorb the sap that exudes so freely. To-day I boxed *Euvanessa antiopa*, *Eugonia polychloros*, *Satyrus circe*, *S. hermione*, and *Hipparchia semele*, with the beetles *Anoplistes ephippium*, *Cetonia affinis*, and the Hymenoptera *Vespa crabro* and *V. vulgaris*, while on the adjoining roadside I took the predatory Hymenopteron *Ammophila sabulosa*. This last is very numerous here. About the gardens one meets with the two swallow-tails *Papilio machaon* and *P. podalirius* at all times during the hot sunshine.

July 15th.—Along the low herbage and amid the bushes at the entrances of the various gorges on the right bank of the Scrivia both sexes of *Scolitantides baton* were numerous with a few *Colias edusa* and *E. antiopa* flying to and fro. I took among other things *Cybosia mesomella*, *Euproctis chrysorrhoea*, and *Lomaspilis marginata*.

July 16th.—To the little valley at the back of the Arquata Scrivia Hotel. On the rising ground at the end I found a colony of *Plebeius aegon* well out, and noted that *L. arion* could still be met with in good condition. The *A. flava* (*thaumas*) here are large in size and with *T. acteon* literally swarm in this locality, with equal abundance of Lycænids in general and Zygænids. Of the latter *Z. carniolica* is perhaps the best just now in freshness.

July 18th.—This afternoon I bicycled through Rigoroso to the next village, Pietrabissara, along the main road in the teeth of a sirocco wind. At the entrance to this village to the right, there is a gorge which has a pleasant stream running down from a waterfall further up. I spent the afternoon here, and in spite of the gusty wind I took several fine male *Polyommatus meleager*, *L. arion*, *Argynnis cydippe* (*adippe*) var. *cleodoxa* and a good number of Zygænids.

July 20th.—By to-day the River Scrivia has completely dried up and one can walk across its wide bed quite dry, although in places pools are left of varying size, where doubtless fish can survive until the autumnal rains afford the necessary water. Between the river and the railway embankment near the bridge there are about half a dozen willow trees, on which to-day I found sheltering, either from the sun or the wind, *E. polychloros*, *S. circe*, and *S. hermione*, whilst on a grassy patch kept moist by a trickling stream coming under the the railway were a number of the dragonfly *Orthetrum caeruleum*. Between this spot and the "Bluff," on the left bank, is a strata of rocky face along the river. Here to-day, resting on the ledges and flying in some number were *Catocala electa*. They are easily caught, for when disturbed they fly only a short distance to another ledge and are readily distinguished.

July 25th.—Late last night we were the spectators of a vivid

lightning storm to the right of Monte Spineto, unaccompanied by thunder or rain, which lasted throughout the night and resulted in an unmistakable cooling of the temperature in the morning. I again bicycled to Pietrabissara, and as there was little wind I did better than the week before. *Lymantria dispar* was very abundant, the females flying later in the day than the males, while *Lasiocampa quercus* was dashing about in the blazing sun. *P. meleager* was plentiful in the gorge, and I took a perfect *Limenitis camilla* second brood. The first brood was on the wing in the last part of May. Among the "Burnet" moths captured to-day I took a nice specimen of the ab. *coronillae* of *Zygaena ephialtes*. This species will possibly take the place of *Syntomis phegea*, which was now for the most part in worn condition. *L. arion* was still on the wing.

July 27th.—On the tree trunks toward Arquata, besides boxing *E. antiopa* and *S. hermione*, I took the beetle *Stenostola ferrea*, and from the road more *Ammophila sabulosa*. A fine specimen of *Apopstes spectrum* was taken in the Villa to-day, the first I have met with. I noticed that the *Pieris rapae* in the gardens now, especially the females, were remarkable for the deep black of the spots and tips, much darker than the summer forms met with in England.

July 25th.—This morning as the wind was in the north we had another magnificent view of the snowy mass of Monte Rosa over the plain of Piedmont. The imagines of *C. electa* were still plentiful on the rocky ledges along the river, and although they have not come to light I find specimens of them in the Villa in the morning, possibly from the steep hillside behind the house.

July 30th.—In the garden this afternoon I saw a specimen of *Callimorpha hera*, and took several females of *Colias edusa* as they settled on the clover heads. A feature of gardens in this district just now is the quantity of marguerites, white with yellow centres, together with fine masses of hydrangea blossoms from the palest blue to various shades of mauve. In the gardens of Rigoroso I have seen sunflowers of exceptional size. (*To be continued.*)—E. B. ASHBY (Lieut., F.E.S.), 1919.

D. NERII AT EASTBOURNE.—On September 13th an Oleander Hawk *Daphnis (Chorocampa) nerii* was brought to me. It was found emerging from the shrubs on the Wish Tower, Eastbourne, and in very good condition, but one antennæ is missing. Curiously it was found within a hundred yards of the specimen of this moth which I recorded as having been taken on July 14th, 1904. To-day I took a pair of *Agriades coridon*, the Chalk Hill Blue, in cop. Is not this an extremely late date?—S. A. CHARTRES, Eastbourne.

CURRENT NOTES AND SHORT NOTICES.

In the *Ent. News* for July, L. W. Mengel describes a new species of *Perisama* from S. America, *P. sineruba* near *P. cotyora*, Hew. J. D. Mitchell gives a list of the plants upon which the omnivorous larvæ of the Arctiid *Diacrisia virginica* were observed feeding in 1917. There are 42 plants and shrubs enumerated, plus "all garden truck." The writer describes the habits of the species and the various means of combatting the evil which is emphasised by there being no less than

five generations in a year. A new *Catocala* (Lep.) and a new genus of *Cerambycidae*, *Megacheuma* are introduced in the same number.

The *Ann. Soc. ent. Belg.*, July, 1919, contains an interesting article on "Instinct and Intelligence" as exhibited by the *Ammophila* (Hym.), illustrated by a series of "experiences."

An extract from the *At. Soc. Ital. Sci. Nat.*, vol. lviii., has been sent by Count Turati, containing a List of the Lepidoptera occurring in the sub-Appennine region of Modena at the elevation of about 1,000 metres from July 12th to September 27th, 1918, with notes on the various species and a description of three new species of Microlepidoptera with figures. Some 65 species of butterflies were observed and opportunity was taken to name still another form of *Parnassius mnemosyne* viz. *constantinii*, a form of *Erebia medusa* viz. *hyperappennina*, a form of *E. stygne* viz. *constantinii*, still another form of *Melanargia galathea* viz. *apicalis*, a form of *Cyaniris semiargus* viz. *semisebrus*, a form of *Lycaena alcon* viz. *italica*, and several new forms among the Heterocera. Unfortunately the nomenclature troubles us, e.g., the use of *idas*, L., a form of *thetis* called *corydon*, *alexis*, Pad. used for *cyllarus*, a *cydippe* form of *niobe*, the non-informative polynomial names, &c. The notes are most useful and suggestive to one who is interested in the Italian fauna, on account of the great knowledge of the literature of what has been done by all previous workers.

The *Bull. Soc. ent. Belg.*, I (iv), p. 60, contains notes on the "*Dytiscidae* and *Gyrinidae* of the neighbourhood of Alost," found from 1915-19, by A. Ball; "Biological Notes on *Odonata*, etc.," by J. Lestage, etc.

An Investigation of the Louse Problem (Research Publications of the University of Minnesota), by W. Moore, B.A., and A. D. Hirschfelder, M.D., is an important treatise dealing with (1) Methods of rearing lice and notes on their biology. (2) Pathological effects of the bite of the clothes louse. (3) Methods of control of the clothes louse. (4) Methods of louse destruction by pediculicides. A large mass of statistics is taken into account and a useful Bibliography is added.

The London County Council have published an 8-paged pamphlet written by A. Bacot, F.E.S., Entomologist to the Lister Institute, entitled *Danger of Disease through Lice and How to avoid it*.

The "Popular and Practical Entomology" columns of the *Can. Ent.* always contain matter which is of great educational value. The subject in the June-July number is "The Variation of Insects" by T. D. A. Cockerell, Colorado. The writer commences his article by a well deserved recognition of our late Editor. He says "Nearly thirty years ago English entomologists began to take a new interest in the variation of Lepidoptera, and in the interval since that time, principally owing to the activities of J. W. Tutt, a very large amount of detailed information has accumulated. Tutt's *British Noctuae and their Varieties*, in four volumes (1891-2), deserves to rank as a classic, although at the time of its publication it was received by many with something less than enthusiasm. More recently the great monograph, of the British Lepidoptera, left unfinished owing to Tutt's untimely death, covered the subject of variation in an exhaustive manner, including all phases of the species treated, whether British or foreign. In its exhaustive character, this work runs parallel with Taylor's *Monograph of the Land and Freshwater Mollusca of the British Islands*,

still in course of publication. The variation of Lepidoptera also receives very full treatment in *The Macrolepidoptera of the World*, edited by Dr. Adalbert Seitz, and published in English, French; and German. This series of volumes, although planned and published in Germany, is thoroughly international in its character, a large part of it being written by English entomologists. The volume on the Palearctic *Noctuidæ*, for example, is the work of the late W. Warren. Further on we find "It is only when the species are fairly well known, and large series of specimens have accumulated that such methods as those of Tutt become possible or advisable." The writer refers also to the experimental side of the study of variation, the earlier days of Weismann and Merrifield, and the later times of Standfuss and of Morgan and his associates, with their marvellous work with the fruit-fly, *Drosophila*, and to the key-work of all experiment that of the world famous Mendel.

To the same number of the *Can. Ent. F. W. L.* Sladen contributes "Notes on the Canadian Representatives of British species of Bees." It appears that of the twenty-eight genera of Bees given in Saunders' *Hymenoptera Aculeata of the British Isles*, no less than twenty-two occur in Canada. The conclusions at which the writer arrives are (1) That the similarity of many species furnishes evidence of a former land connection with a climate comparable to that of Britain or Ontario. (2) That the differences evidently represent a definite principle. Canadian forms smaller, with a shorter, closer, shaggier coat, colour not so rich, paler or more dingy. Usually white bands if liable to occur are more developed in Canadian representatives of a genus. Finally, at considerable length, a search is made for the causes of these and other differences.

In the *Revue Mens.* of Namur for July, M. Cabeau has described and named several new forms of Rhopalocera. *Apatura ilia*, ab. *periommatata*, ab. *alcithoë*, ab. *lambillioni*, and ab. *melanthes* are new, and ab. *phryne*, Aigner, is new to the Belgian list. M. Lambillion describes and names a new form of *Melitaea dictynna*, viz., ab. *mojartsi*. While M. Derenne describes a new aberration of *Papilio machaon* as ab. *adaperta*, in which the cell of the hindwings is not closed and the black mark which is so conspicuous along the transverse or discocellular nervure is divided into two. He also describes an aberration of the *hospita* form of *Parasemia plantaginis* in which the recurved spot at the end of the cell in the hindwing is absent and the subabdominal black band is narrow and only exists in the basal region, as ab. *scalena*.

In the *Ent. Mo. Mag.* for August, H. J. Thouless announces a Longicorn beetle as new to Britain in *Leptura rubra*, which he took at Horsford, near Norwich. It is closely allied to *L. fulva*. On the continent it is widely distributed in pine-woods. A new British Dipteron is announced by F. W. Edwards, B.A., in *Gnophomyia tripudians*, bred from larvæ taken under bark at Mildenhall, Suffolk, it belongs to the *Eriopterini*. Dr. Chapman, F.R.S., and Capt. P. A. Buxton, F.E.S., give a detailed account of the life-history and structure of *Tarucus mediterraneæ*, a species recently described by G. T. Bethune-Baker in his Revision of the Genus *Tarucus*.

In the *Rev. Mens. Namur* for August, M. Cabeau traverses the generally received opinion of the habit of the females of *Limenitis populi* to remain at the top of the trees and visit the ground only for a

short spell in the afternoon. During the past five years he has captured more than twenty specimens at all times from about 8 o'clock in the morning until nearly 5 p.m., on the 4th of July, 1915, three specimens at the same place. He says that the females have the same liking for putrid matter in the roads through the wood as the males have. M. Lambillion describes a new aberration of *Lymantria dispar* as ab. *mediofusca*, in which the forewings have a wide fuscous transverse median area above, and below have a large irregular brown band occupying the outer half of the wing. M. Derenne describes (1) an aberration of *Xylocampa areola* as ab. *rhodana*, in which the forewings are suffused rosy, as are also the marginal area of the hindwings, and states that it is somewhat common each year near Namur. This appears to have been already named *rosea* by Tutt (*Brit. Noct.*, iii., 98), and hence the name *rhodana* is redundant; (2) an aberration of *Cyclopides palaemon* as ab. *nigra*, in which the forewings are so much suffused with black that the yellow spots become almost lines, and the hindwings have the series of yellow submarginal dots almost effaced.

The *South-Eastern Naturalist*, the organ of the South-Eastern Union of Scientific Societies, for 1918 (!) has just been issued. The name "Naturalist" is justified by the five or six pages on "Mosquitoes and Malaria in Britain," contributed by Sir Ronald Ross, and by the paper on "Allotment pests," by Lieut. Robt. W. Ashcroft, of the Board of Agriculture. It is a great pity that this admirable organisation for linked working has not been backed by a section of the active zoological workers of London and the south-eastern counties. It is very unusual to find letters of the wrong font scattered over the pages even in war time, there has been plenty of time since June, 1918, to revise.

In the *Ent. Mo. Mag.* for September, K. G. Blair, F.E.S., writes an article on the rose beetle, *Cetonia aurata*, and announces the occurrence of the shining black aberration var. *nigra* of the European list, hitherto not recorded in the British Isles. E. A. Butler, B.A., B.Sc., announces the addition of *Lasiacantha capucina*, a Hemipteron new to Britain. It was found by J. H. Keys, on the cliffs at the Lizard, Cornwall, on its known food plant, wild thyme, in June last. The Rev. F. D. Morice announces a sawfly new to Britain, *Lygaeonematus wesmaeli*, bred in May, 1918, from larvæ first observed in August, 1917, in Yorkshire, on larch. It is closely allied to *L. laricis*, and has been recorded from Holland and Germany.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

June 26th.—LIFE-HISTORIES OF VARIOUS COLEOPTERA.—MR. K. G. Blair exhibited *Chrysomela distinguenda* with ova and larvæ on toadflax, on behalf of Mr. Campbell Smith *Cetonia aurata* from Berks, and on behalf of Mr. G. Wright, *Lytta vespicatoria* from Norfolk, giving particulars of the life-history of the last.

PUPA OF *A. iris*.—MR. NEAVE, for Mr. Tatchell, a pupa of *Apatura iris* from the New Forest.

LIFE-HISTORIES OF COLEOPTERA.—MR. H. MAIN, the beetle *Necrophorus vespillo* and larvæ, and ova of *Melolontha vulgaris* and gave notes on the life-histories.

LARVÆ OF LEPIDOPTERA. — Mr. Ashdown, a living *Hylophila bicolorana*, larvæ of *Diaphora mendica*, and a larva of *Drepana binaria* (*hamula*), all from Surrey.

EXHIBIT OF VIPER AND OF LIZARD. — Mr. Barnett, on behalf of Mr. Coppard, a Viper from Lincolnshire, a Lizard (*Lacerta vivipara*), and larvæ of *Cerura furcula* from Limpsfield.

EXHIBIT OF SPIDER AND OF SLUG. — Mr. Priske, the spider *Epeira umbratica* and the large slug, *Limax flavus*, from Ealing.

PARASITE ON G. RHAMNI. — Mr. Step, larvæ of *Gonepteryx rhamni* and cocoons of its Dipterous parasite from Wisley.

EXOTIC THECLIDÆ. — Mr. Edwards, conspicuous species of Exotic *Theclidæ*, S. American, and Indian.

NOTES. — Mr. Dennis sent natural history notes from Llanberis.

July 10th. — P. ATALANTA FROM FLORIDA. — Mr. Moore exhibited *Pyrameis atalanta* from Dunedin, Florida.

ABERRATIONS OF BRITISH LEPIDOPTERA. — Mr. Sperring, a series of suffused specimens of *Brenthis euphrosyne* from Lincolnshire, a bred series of *Mimas tilia*, including ab. *centripuncta*, ab. *suffusa*, and other forms, from Blackheath.

A LOCUST. — Mr. Barnett, a large locust sent from Gibraltar alive.

SAWFLIES. — Mr. Coppard, several of the larger British sawflies.

ABERRATIONS OF P. RAPAE. — Mr. B. S. Williams, aberrations of *Pieris rapae*.

LARVÆ, AND ABERRATIONS OF BUTTERFLIES. — Mr. Humphries, larvæ of *Lymantria dispar*, from Holland, larvæ of the Solomon-seal sawfly, and aberrations of *Aglais urticae* and *Vanessa io*.

SERIES OF N. FOREST EUPITHECIA. — Dr. Robertson, short series of New Forest "pugs," *Eupithecia*, and a fine series of *Cleora glabraria*, bred from N. Forest larvæ, including one with a minimum of marking bred from a perfectly black larva.

S. AMERICAN PAPILIOS. — Mr. Edwards, *Papilio* species of the *Ascanius* group from S. America.

THE SEASON. — Remarks were made on the scarcity of Butterflies this season.

July 24th. — ABERRATIONS OF BRITISH LEPIDOPTERA. — Mr. Sperring exhibited aberrations of (1) *Brenthis euphrosyne* with spots coalesced to form solid lines; (2) *Pararge aegeria*, underside with primrose markings and extended central blotch, another very dark suffused underside; (3) *Amorpha populi*, very dark unicolorous specimen, and a series with wide aberration in banding and in colour.

BRITISH COLEOPTERA. — Mr. West, the beetles *Onthophagus taurus*, from Malta and Gibraltar, and *O. nutans*, from Epping Forest.

GLOWWORMS FROM DIFFERENT LOCALITIES. — Mr. Main, living glowworms from Delamere and the I. of Wight, the former only half the size of the latter.

A SIREX IN THE STRAND. — Mr. Ash, a *Sirex gigas*, taken in the Strand.

S. AMERICAN PAPILIOS. — Mr. Edwards, species of *Papilio*, from S. America, of the *protesilaus* section.

PUPA-CASES OF C. W-ALBUM. — Mr. Carr, pupa cases of *Chattendenia w-album* in situ on the undersides of the leaves of wych elm.

Subscriptions for Vol. XXXI. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 [This subscription includes all numbers published from January 15th to December 15th, 1919.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Ten Shillings, and must be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 Cheques and Postal Orders should be made payable to H. E. PAGE.

ADVERTISEMENTS of Books and Insects for Sale, or Books wanted will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14

Subscribers who change their addresses must report the same to Mr. H. E. PAGE "Bertrose," Gellatly Road, New Cross, London, S.E., otherwise their magazines will probably be delayed.

New Cabinets and Apparatus.—Note: Finest make only, and best material only used.

12, 20, 30 and 40 drawer Cabinets in polished deal or mahogany. Specifications and prices on application.

Standard make Store Boxes, 10×8, 5/6; 13×9, 7/-; 14×10, 8/-; 16×11, 9/-; 17½×12, 10/-; postage 6d. extra. Special price by taking 12 or more of one size.

Insect and Egg Cases, Jointed Nets, Pins (Tayler's), Zinc Collecting Boxes, Setting Boards, Killing Tins, etc., etc.

Write for complete lists of set specimens, apparatus, larvæ and pupæ.

LEONARD TATCHELL, Lepidopterist, 43, Spratt Hall Road, Wanstead, E. 11.

Duplicates.—*A. immorata*, *P. affinitata*, *E. venustula* (4), *S. andrenaeformis* (7), *S. sphegiformis* (3), *I. globulariae* (4), *I. statice* (10), *E. miniata* (2), and others.

Desiderata.—*M. bombyliformis*, *S. apiformis*, *S. crabaniformis*, *S. formiciformis*, *S. ichneumoniformis*, *S. philanthiformis*, *S. chrysidiiformis*, *L. pygmeola*, *L. muscerda*, *L. caniola*, *E. cribrum*, and many others.—*H. B. Sly, 45, Warrford Court, London, E.C.*

Duplicates.—Varleyata and other varieties of *Grossulariata*. *Desiderata.*—Good varieties and local forms. *Spilosoma urticae*, *Advenaria*, and other ordinary species to renew old series. Good *Tortrices* and *Tineæ*.—*Geo. T. Porritt, Elm Lea, Dalton, Huddersfield.*

Duplicates.—*Grossulariata* var. *lutea*, *lacticolor*, *varleyata*, *fulvaticata*, etc. *Desiderata.*—Other extreme forms of *Grossulariata*, or good vars. of *Diurni*.—*Rev. G. H. Raynor, Hazeleigh Rectory, Maldon, Essex.*

Desiderata.—*Euchloë cardamines* from Ireland; also types of *E. cardamines* from Switzerland, Italy, S. France; var. *turritis* (S. Italy), var. *volgensis*, var. *thibetana*, and of *E. gruneri*, *F. euphenoides*, *E. damone*, and any palearctic species of the genus. *Duplicates.*—*Loweia dorilis* and vars., a few minor vars. of *R. phleas* (British), and many British lepidoptera.—*Harold B. Williams, 82, Fifeley Avenue, Stoke Newington, N.*

Duplicates.—*A. coridon* vars., including semi-syngrapha, *H. Comma*. *Desiderata.*—*A. coridon* var. *Albicans* (Spanish) and var. *Hispana* (do.), and good butterfly vars., especially from Ireland.—*Douglas H. Pearson, Chilwell House, Chilwell, Notts.*

Duplicates (all Clydesdale).—*Æthiops*, *Selene*, *Icarus*, *Phleas*, *Hectus*, *Mundana*, *Perla*, *Fulva*, *Nictitans*, *Tritici*, *Chi*, *Boreata*, *Cambrica*, *Belgiaria*, *Immanata*, *Olivata*, *Tristata*, *Boreata*, *Mercurella*, *Angustea*, *Dubitalis*, *Ambigualis*, *Truncicolella*, *Derepitalis*, *Kuhmella*, *Fusca*, *Margaritellus*, *Hortuellus*, *Hyemana*, *Phryganella*, *Ferrugana*, *Solan-drinana*, *Sponsana*, *Cohwayana*, *Stramineana*, *Rivulana*, *Urticana*, *Octomaculana*, *Perlepidana*, *Vaccinana*, *Geminana*, *Herbosana*, *Myllerana*. *Desiderata.*—Numerous, especially.—*A. A. Dalglish, 7, Keir Street, Glasgow.*

Duplicates.—*T. pruni* (very fair); *Moneta* (bred); *T. cratægi* (bred); *Lucipara* (bred); *Juniperata* (bred); pupæ of *Bucephala*; ova *T. cratægi*. *Desiderata.*—Very numerous, to renew and extend.—*Wm. Foddy, 39, York Street, Rugby.*

CHANGE OF ADDRESS.—*R. S. Mitford, 5, Lisburne Crescent, Torquay.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m.: 1919, Oct. 15th.

The South London Entomological and Natural History Society, *Hibernia* Chambers, London Bridge.—*Hon. Sec.*, Stanley Edwards, 15, St. German's Place, Blackheath, S.E. 3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society).—Hall 20, Salisbury House Finsbury Circus, E.C. The First and Third Tuesday in the month, at 7 p.m. Visitors invited. *Hon. Sec.*, J. Ross, 18, Queens Grove Road, Chingford, N.E.

All MS. and editorial matter should be sent and all proofs returned to HY. J. TURNER, 98, Drakefell Road, New Cross, London, S.E.14

We must earnestly request our correspondents NOT to send us communications IDENTICAL with those they are sending to other magazines.

Lists of DUPLICATES and DESIDERATA should be sent direct to Mr. H. E. Page, Bertrose, Gellatly Road, New Cross, S.E. 14

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

H. W. HEAD, Entomologist,

BURNISTON, Nr. SEARBOROUGH.

Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

G. A. Bentall, F.Z.S.,

~ NATURALIST. ~

10-drawer Deal Entomological Cabinets, lift off glazed tops, £6 10s. 0d.

20-drawer ditto, also with lift off glazed top Drawers, $17 \times 15 \times 2''$, £21.

40-drawer New Entomological Cabinets, with Mahogany panel doors, £70 each.

Carton Store Boxes. $15\frac{1}{2} \times 10\frac{1}{2} \times 2\frac{1}{8}''$, wood sides, hinged lids, cork bottom. 3s. 9d. each.

Postal or Store Box. $7\frac{1}{2} \times 12''$ Wood sides, cork bottom, lined white. 1s. 4d.

Best Pine Store Boxes. $13 \times 9''$, 7s. each; $14 \times 10''$, 8s. each; $16 \times 11''$, 10s. each.

Whitewood Double Store Boxes. $14 \times 12 \times 3''$, 9s. 6d.; $17 \times 12 \times 3''$, 11s.

Whitewood Travelling Setting Houses. $16 \times 12 \times 4\frac{1}{2}''$, hinged ends, 13s. 6d.

Pine Breeding Cages for low feeding larvae. $16 \times 12 \times 7\frac{1}{2}''$, 7s. 6d., better quality, 10s. 6d.

Pine Larvae Breeding Cage, with glass door, $16 \times 12 \times 12''$, 25s. each.

Superior Oval Cork Setting Boards.

$\frac{3}{8}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4ins.
6d.	$7\frac{1}{2}$ d.	1s.	1s. 3d.	1s. 4d.	1s. 6d.	2s.	2s. 3d.	2s. 6d.	3s.

Cork Sheets—

$19\frac{1}{2} \times 19\frac{1}{2} \times 3\frac{3}{16}''$	$11\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{8}''$	$11\frac{1}{2} \times 3\frac{1}{2} \times \frac{3}{16}''$	$11\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{4}''$
2s. per sheet.	2s. doz. sheets.	3s. 6d. doz. sheets.	4s. 6d. doz. sheets.

Round Chipette Boxes, very strong—

$1\frac{1}{4} \times 1\frac{1}{2}''$	$1\frac{3}{4} \times 1\frac{1}{4}''$	$2 \times 1\frac{1}{2}''$
8d. doz.	10d. doz.	1s. 6d. doz.

Round White Metal Boxes—

$1\frac{3}{4} \times \frac{3}{4}''$	$2 \times \frac{3}{4}''$	$2\frac{3}{4} \times 1\frac{1}{8}''$	$3 \times 2''$
6d. doz.	$7\frac{1}{2}$ d. doz.	1s. 3d. doz.	1s. 9d. doz.

Glass Top Metal Boxes—

$1\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$ ins.
3s. 4d.	4s. 4d.	5s.	7s. 9d.	8s. 9d. per doz.
$3\frac{1}{2}$ d.	$4\frac{1}{2}$ d.	$5\frac{1}{2}$ d.	8d.	9d. each.

Type Collections of British Noctuae and Geometrae. 100 6s. 6d., 200 17s. 6d., 300 30s., 400 50s.

British Micro-Lepidoptera and Coleoptera at same rates.

Price Lists post free for Books, Apparatus, British, Continental, and Exotic Lepidoptera, Coleoptera, Birds' Skins and Eggs.

**DUDLEY HOUSE, SOUTHAMPTON ST. (opposite Hotel Cecil),
STRAND, W.C. 2.**

The Entomologist's Record

AND

Journal of Variation

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.

GEORGE T. BETHUNE-BAKER,

F.L.S., F.Z.S., F.E.S.

M. BURR, D.SC., F.L.S., F.Z.S., F.E.S.

(REV.) C. R. N. BURROWS, F.E.S.

(REV.) GEORGE WHEELER, M.A., F.E.S.,

and

HENRY J. TURNER, F.E.S.,

Editorial Secretary.

T. A. CHAPMAN, M.D., F.R.S., F.E.S.

JAS. E. COLLIN, F.E.S.

H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

JOHN HARTLEY DURRANT, F.E.S.

ALFRED SICH, F.E.S.

CONTENTS.

PAGE.

Seasonal Polymorphism and Races of some European Grypocera and Rhopalocera, <i>Roger Verity, M.D.</i>	193
Notes on <i>Cemiostoma walleella</i> and other Lepidoptera in Sussex in 1919, <i>Alfred Sich, F.E.S.</i>	201
SCIENTIFIC NOTES AND OBSERVATIONS:— <i>Hyponephele lycaon</i> , Rott. and <i>H. lupinus</i> , Costa, two distinct species, <i>R. Verity, M.D.</i> ; <i>Abraxas grossulariata</i> ab. <i>exquista</i> and ab. <i>pulchra</i> , (Rev.) <i>G. H. Raynor, M.A.</i>	204
NOTES ON COLLECTING:— <i>P. megera</i> in Essex and Gloucestershire, <i>C. Nicholson</i> ; Some suggestions to Mr. Ashby on specimens collected in Italy, <i>R. Verity, M.D.</i> ; Saint Mark's Fly (<i>Bibio marci</i>), <i>Joseph Anderson</i> ; <i>Sirex gigas</i> at Chichester, <i>Id.</i> ; <i>Daphnis nerii</i> at Studland, Dorset, <i>H. Riviere</i> ; Dorset, <i>D. H. Pearson, F.E.S.</i> ; Notes on Entomology in France and Italy in 1918, <i>E. B. Ashby, F.E.S.</i>	206
CURRENT NOTES AND SHORT NOTICES	210
SOCIETIES:—The South London Entomological Society	211
SUPPLEMENT:—The completion is still held over.	

NOVEMBER 15th, 1919.

Price ONE SHILLING (NET).

Subscription for Complete Volume, post free
(Including all DOUBLE NUMBERS, etc.)

TEN SHILLINGS.

TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,

"BERTROSE," GELLATLY ROAD, NEW CROSS, S.E.14.

Communications have been received or have been promised from Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, Parkinson Curtis, H. Donisthorpe, A. Sich, Dr. Verity, C. W. Colthrup, Rev. C. R. N. Burrows, Dr. T. A. Chapman, Capt. Burr, G. T. Bethune-Baker, E. B. Ashby, P. A. H. Muschamp, J. H. Durrant, Orazio Querci, G. B. C. Leman, R. S. Mitford, W. B. Davis, with Reports of Societies and Reviews.

WATKINS & DONCASTER.

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/5, 2/2, 2/6, 3/2. Folding Nets, 3/9, 4/3, 4/9. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 7d., 10d., 1/2, 1/10. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 9d. per four dozen, 1 gross, 2/-. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/7 per tin. Store-Boxes, with camphor cells, 2/3, 2/9, 4/-, 4/3, 5/3, 6/8. Setting-Boards, flat or oval, lin., 6d.; 1½ in., 8d.; 2 in., 10d.; 2½ in., 1/-; 3 in., 1/4; 4 in., 1/6; 5 in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 10/6, 12/9; corked back, 15/9. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/9, 4/6, 5/6, 8/3. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/9 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, 1/2 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/6. Glass-top and Glass-bottomed Boxes, from 1/3 per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d., 1/-; Blowpipes, 4d., 6d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families and for all insects liable to become greasy.

We stock various sizes and lengths of these Silver Pins which have certain advantages over ordinary entomological pins (whether enamelled black or silver or gilt).

NESTING BOXES of various patterns which should be fixed in gardens or shrub beries by lovers of birds before the breeding season.

SHOW ROOM FOR CABINETS

Of every description for INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS &c.

Catalogue (84 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).
Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.

Bexley]

L. W. NEWMAN

[Kent

Has for sale a superb stock of 1918 specimens in fine condition, including Varleyata; Bicuspis; Pendularia var. Subroseata; Melanic forms Lariciata, Consortaria, Consonaria, Abietaria; Irish forms Aurinia and Napi, fine vars. Tiliæ, Yellow Dominula, etc., etc. Quotations and Insects sent on approval with pleasure.

Also a huge stock of fine PUPÆ and OVA.

Write for latest-price lists.

NOTICE:—Owing to huge rise in cost of metal, etc., my **Relaxing Tins** are now **3/6** small and **5/6** large, post free.

GALLS AND PIERCED BRAMBLE AND BRIER STEMS.—MR. L. A. BOX would be very grateful for any sorts and quantities, with localities, from all parts of the United Kingdom.
80, Northampton Road, Croydon.

Seasonal Polymorphism and Races of some European Grypocera and Rhopalocera.

By ROGER VERITY, M.D.

(Continued from page 184.)

Melitaea athalia, Rott., race *TENUIS*, mihi; race *TENUICULA*, mihi; race *OBSCURA*, mihi. In the Italian Alps are found *helvetica*, Rühl (type preserved in Florence in the Rühl coll. of the R. Stazione d'Entomologia Agraria), *delminia*, Frhst., and *celadussa*, Frhst. In Piedmont, and more exactly near Turin, the wonderful little race is found, which I have called *aureliaeformis* [*Bull. Soc. Ent. Italiana*, xlviii., p. 186 (December, 1916)], because a great many individuals have quite a characteristic look, reminding one markedly of that of *aurelia*; some males only measure 25 mm. in expanse and females 28; the black pattern is of a very deep tinge on both surfaces, broad and shaded in outline; the fulvous is dull, often very red in tone and so are the rust-coloured spots of the underside, which sometimes are faint and have a yellow centre. Specimens of this peculiar little form are mixed with others quite similar to Tuscan ones and with transitions; the palpi are always blackish and never more reddish than in many unquestionable *athalia*.

Further south one meets with giant *maxima*, Turati, in certain localities of the coast (Isle of Elba; Calabria); it comes nearest to *mehadiensis*, Gerh., of Hungary, and has an extensive black pattern. In other localities of the coast and inland a race is generally distributed in the whole of peninsular Italy and Sicily, which is quite different from the Central European one,* and which I propose calling *tenuis*; it is also found in Spain and probably more diffused there than *magna*, Seitz, *iberica*, Stdgr., and *dejoneformis*, Vrtý. (the last name I have substituted in *Bull. Soc. Ent. Ital.*, xlv., p. 208, to that of *nevadensis*; Obth., preoccupied by a race of *parthenie*). I take as typical of *tenuis* a series from Pian di Mugnone, near Florence. At high altitudes it becomes smaller: race *tenuicula*, mihi; typical series from Bolognola in the Sibillini Mountains, 1200 m. The male of *tenuis* generally measures about 31 mm.; but varies from 27 to 34 mm.; the female varies from 33 to 36 mm., and one of my specimens, agreeing with *aureliaeformis*, measures 26 mm. Individual variation is very great and extreme forms reach the nymotypical one, *dejoneformis*, and the pattern of such specimens as those figured by Seitz in *Grossschmett.*, under the names of *mehadiensis*, *magna*, and *iberica*, although they never reach those sizes. On the whole the fulvous is much brighter and warmer than in Central European races; the black pattern is much thinner and the comparative extent of its various parts confers to it more the look of that of *dejone* or *parthenie* than of nymotypical *athalia*, in which it gives more the impression of an even network; the median S-shaped band particularly is much more variable; it is often absent on the hindwings; also on underside the pattern is thinner and the rust-coloured spots more extensive and brighter. In a general way this race may be said to culminate in *dejoneformis*, which is more particularly a high mountain form, but

* I consider this the nymotypical race, because Rottemburg named *athalia* the insect described by Geoffroi in *Hist. d. Ins.*, as *var. B.* of *cinzia*, from Parisian specimens.

nowhere in Italy is it known to predominate as in certain Spanish localities. Females such as those figured by Oberthür are not unfrequent even in the lowlands, but males well characterised are rare in Italy, and are only found at high altitudes and in cold, dry localities; it stands directly opposite to *maxima*, Turati. In southern Italy and in Sicily *tenuis* is found in the plain, but *tenuicula* is no more found in the mountains. On the Aspromonte, at 1200m., a race exists even larger than *tenuis*, of a deep reddish tinge, with widespread black pattern, so much so that in the female there often exists an extensive black suffusion at the base of the wings (race *obscura*, mihi). Oberthür describes from the Madonie Mts. in Sicily a race with an extremely pale female, covered by such an abundant suffusion of greenish black as to make it look like the mountain *parthenie*; it has been named *sicula*, Turati, *Att. Soc. Ital. Sci. Nat.*, vol. liii., p. 600 (1914).

I must lay stress on the fact that the melanotic aberration of *athalia*, always called *navarina*, Selys (1837), should be called *cymothoë*, Bertoloni [*Annali di Storia Naturale di Bologna*, II., pp. 237-40 (1829)], having been described several years before by this Italian entomologist from a specimen of the Promontorio Lunese, south of the Gulf of Spezia. The "type" is now in my possession.

To the distinctive characters between *athalia* and *parthenie* mentioned by Wheeler in *The Entomologist* for 1908, I must add that of the colour of the anal portion (near the hindmargin) of the hindwing, which in the former is usually partly fulvous and which is always entirely black in the latter. In Central Italy this character is absolutely constant, making it quite easy to separate *tenuicula* from *parthenie* race *varissima*, Vrtý., with which it flies in the Sibillini Mts.; in other races I find exceptions. Amongst hundreds of specimens examined from that locality I find two males (N. 498 and 499) and a female (N. 560), which actually seem to be hybrids between those two species, although I am very sceptical about hybrids generally; anyhow I should call these intermediate looking forms PARTHENIDES and ATHALIDES; the first is on the whole more similar to *athalia*, but it has the black pattern of the underside of the forewings quite obliterated, as in *parthenie*; the second comes nearest the latter species, but has this pattern well developed, as in *athalia*, and the anal portion of hindwings above entirely light fulvous.

Brenthis dia, L., race LAETIOR, mihi, and second and third gen. FLAVENS, mihi. If the Central European race be taken as nymotypical, although Linneus's habitat "Austria" is rather vague, it is seen that the first brood of Central Italy differs from it by its slightly larger size, by its brighter colouring, and by the lesser extent of the black pattern. The two summer broods have quite a different look: above the ground-colour is of a yellowish fulvous, much less bright; the black pattern very reduced; the cubital zone of the hindwings is always entirely fulvous, instead of being covered by a black suffusion; on the underside the purple colouring is reduced in extent and broken up by broad yellowish spaces and is often replaced by a reddish fulvous; this form comes nearest to *leonina*, Frbst., and to *diniensis*, Obth., but it is smaller and frailer; I take as typical the third brood of Florence.

Brenthis hecate, Schiff., race FLORIDA, mihi. Staudinger and nearly all authors credit Esper with this species, but the name first appears in the List of the butterflies of Vienna, and Esper says he figures specimens sent to him under that name. A series from Mt. Musiné, near Turin, is exactly similar to them. The Tuscan race is, on the contrary, distinctly different by its larger size, especially in the female sex, and probably by a reduction of the black pattern, although there exists much individual variation in this respect. Males from Florence vary from 35 to 40mm., females from 42 to 45mm.

Issoria lathonia, L., race EMIFLORENS, mihi. In the *Ent. Rec.*, xxviii., p. 130 (1916), I suggested the name of *florens* for "the commoner, larger, and brighter form, such as our Tuscan one" to distinguish it from the small and pale specimens of northern localities; to which the Linnean specimen belongs; the first quotation after the original description is *Fauna Suecica*, thus fixing the Scandinavian race as nymotypical. I can now better define the variation of this species. In the south seasonal dimorphism is very marked: the first generation is quite similar to the northern race, except perhaps for the brighter colour of some individuals. The other two broods differ from it constantly by the very great reduction or total absence of the greenish-black shading at the base of the wings above, as well as by their large size and brighter colouring. The culminating form, with no suffusion at base, black pattern reduced in extent, large size, such as is found frequently in certain localities (types from Vallombrosa, 1000 m., and Mount Fanna, 600 m., near Florence), can be taken as characteristic of *florens*. However, even in Tuscan localities (Bagno di Lucca) this form may never be seen, and only transitional ones are found, similar to the summer form of Central Europe; thus, the new name of *emiflorens* becomes necessary for these races, decidedly less conspicuous than those where *florens* is abundant. Nymotypical *lathonia* of the north and of the first brood of the south measure in both sexes 30-38 mm.; the summer broods of the south vary from 38 to 48 mm.

Argynnis aglaja, L., race LOCUPLES, mihi, and race EMILOCUPLES, mihi. The Scandinavian race must be considered the nymotypical one, because the Linnean specimen is evidently a northern one and because the original description is followed by a quotation of the description in *Fauna Suecica*. This race is transitional between *borealis*, Strand, of the far north and those of Central Europe. The latter differ from it by their much greater size, by the brighter and warmer fulvous, by the lesser extent of the black pattern, by the more extensive silver markings of the underside, and by the complete absence of the female form with a whitish ground-colour and diffused black pattern, which Tutt has called *pallida* and considers analogous to *valesina* of *paphia*. This race must surely be distinguished and I call it *locuples*, taking as typical my series from the Valdieri Baths, 1375m., in the Maritime Alps; a few specimens I possess from the Grand Salève near Geneva, and from the Simplon seem to agree with it. A series from Berlin fits in the gap between these Alpine and the Scandinavian race, and is distinct enough a gradation to be separated under the name of *emilocuples*. From the British Isles I possess

nymotypical *aglaia* of Durham and Scotland, and *emilocuples* of the South of England. In Central Italy the species becomes again smaller and the black pattern is often as reduced as in *vitatha*, Moore, of Central Asia; I have called it race *appenninicola*. The male specimen from the Abetone Pass figured by me in the *Bull. Soc. Ent. Ital.*, xlv., pl. I., fig. 4, should alone be taken as the type, because the female of the Sibillini Mts., fig. 5, is not the corresponding individual form, and is in this race quite an exceptional specimen, very similar to *locuples*.

Argynnis niobe, L., race *pinguis*, mihi. In this case Linneus gives no quotations after his original description; so we only have the specimens he has left us to go from in establishing the nymotypical race. They are certainly not of the large, bright, Alpine race, equivalent to *locuples* of *aglaia*, so that I feel justified in proposing a name; I select as typical my series of the Baths of Valdieri.

Argynnis esperi, *Vrty (= *cydippe* auct. nec L. = *adippe* auct. nec L.), race *clarens*, mihi. Facts are so obvious concerning the necessity of the change of name I have suggested in this species that I fear I must maintain my view about it, although I have carefully considered the objections which have been published, and which in other cases have convinced me that the names in use could, or should be kept up. Esper unfortunately does not give the exact locality of the specimen he has figured, and which I have taken as the type of *esperi*, but it certainly is of German origin. It is rather small and dull, and the underside of the hindwings is washed with pale fulvous. In *baiuvarica*, Spüler, the upperside is very bright and the underside washed with rust-red; in *mainalia*, Frhst., the size is larger and the colour deeper; these correspond to *locuples* of *aglaia* and are Alpine. In the South of Europe *adelassia*, Frhst., from the south of France (Mentone), is described as very large and bright, with no washing on underside. In Italy a race is found, which does not seem to vary in the least in the whole of its extent, from Turin, Valdieri, and Vitriolo (Tyrol) to Calabria, and from high mountains to the sea. It is smaller than the Alpine races, the upperside is of the light, but very bright fulvous, characteristic of several Italian *Argynnidi*; black pattern limited in extent and extremely so in certain specimens, being particularly obvious in the female sex; no washing on underside as a rule, but, if traces of it appear, they are green, as in *chlorodippe* from Spain; I possess *clarens* also from Barcelona; types from Florence.

Dryas paphia, L., race *magnata*, mihi, and race *magnifica*, mihi. The Linnean specimen and the quotation of *Fauna Svecica* fix the Scandinavian or northern race as nymotypical. This differs from all the others by the sharp contrast between the pure white, silvery ground colour of the underside of hindwings, reaching as far as the external margin, and the bands and spots of a rather deep green even in the male; it is also of small size (about 50 mm.), and sometimes extremely small (45 mm.). In Central Europe the size is as a rule greater; males in my collection from Maine-et-Loire in France measure, for instance, 62 mm.; the contrast between ground colour and

* [*cydippe* L. of *Brit. Nat. Com.*—Eds.]

pattern mentioned above is less marked, because the former is washed over more or less diffusely with green scales in the basal half of the wing and with pinkish scales in the external half, whilst the latter are of a lighter green and distinctly yellowish in the male, or even quite yellow in the basal half. In the South of Europe these characters of the underside become more accentuated and on the same surface of the forewings the black dots become smaller, shaded off and reddish in tinge; individuals appear in variable numbers, according to localities, in which the silvery band-like spaces are so limited and veiled over as to become nearly imperceptible. To this individual form Seitz correctly applies the name *immaculata*, Bellier, this author distinctly stating in his original description that in the Corsican high mountain locality, where his types had been collected, this was by no means the most abundant form; he also states that the bands were of a more or less dark green. Staudinger describes his *anargyra* as having the underside yellowish, so that it is not a synonym of *immaculata* to which he had himself condemned it in the last edition of his *Catalog*. There are in the extreme parts of Southern Europe regions where *anargyra* is alone found or predominates, and where the underside of the hindwings is distinctly of a light pea-green with a golden, instead of a silvery, sheen, showing it is a transition to *dives*, Obth., of Algeria; to these races the name *anargyra* is evidently appropriate. The two gradations of Central and of Southern Europe described above I should call *magnata* and *magnifica*, taking respectively as typical a series from Les Boutardières (Maine-et-Loire), and a series from Florence. The race *magnata* produces, par excellence, the form *valesina*; *magnifica* produces it in a few regions, such as in Corsica and at the Baths of Valdieri, but as a rule it does not. The race last mentioned spreads all over peninsular Italy; in the Isle of Elba and in Sardinia it is replaced by *anargyra*.

Pyrameis cardui, L., race *UNIVERSA*, mihi. Linneus's quotation of "*Fauna Svecica*" fixes the Scandinavian race as the nymotypical one. It just happens that this is about the only local race produced by the species in its world-wide area of distribution. [I cannot believe that the minute characters on which Stichel in Seitz's *Gr.-Schm.*, grounds his race *japonica* can be constant in Japan. Had his description been more inclusive it could have been used for *universa*. As it is, it can only stand for a special individual form—R.V.]. In the north of Europe the black pattern has much more extent than anywhere else, so that the apical and posterior patch of the forewing are in extreme individuals joined together by a band (form *CONJUNCTA* mihi.), the basal half of hindwings is entirely black, except a round space beyond the cell, the eye-spots are very large, shadowed and often confluent; the underside is also of a peculiar dark chestnut colour; very pale individuals of this race have been called *pallida*, Schöyen. In the rest of the world, all the black pattern is lesser in extent and not confluent, as described above, and the underside varies from gray to ochreous yellow; to be accurate this world-wide race should be named, as a contrast to the northern one, and I propose calling it *universa*, taking as typical a series from Florence, which is as good a locality as many others in which the extreme individual forms mentioned below are found in about equal quantities, thus furnishing a fair medium. Although *cardui* does not

produce true geographical races, its individual variation is very great and in limited localities, found all over the world and thus not having any real geographical value, one meets with a distinctly higher percentage of one of the extreme forms, so that series from localities even quite near to each other may look very distinct. It is quite clear that these variations are only due to favourable or unfavourable conditions to the development of the larva. Few species vary as much in size: any fairly extensive series contains variations from 35 to 60mm. in expanse; the ground colour varies from a uniform bright carmine to ochreous yellow, which is also uniform, except at the base of cell, where it is carmine, and at its extremity, where it is whitish; the largest individuals are usually the brightest, but there are numerous exceptions, the size chiefly being due to the amount of food available, the colour to the degree of moisture.

Cramer in his *Papillons Exotiques*, pl. xxvi., fig. E, figures under the name of *carduelis* a specimen from the Cape of Good Hope of the largest, brightest, and most vigorous *cardui*; it seems to me that the name should be revived to designate this form. Failla [*Naturalista Siciliano*, vii. (1889)] has called *minor* the extremely small and pale specimens; his description evidently refers to dwarfs of 35-40mm.; the name cannot in consequence stand for the commoner form, contrasting with *carduelis*, but not pathological, expanding about 45mm., with more elongated wings, pale ochreous, black pattern less extensive; I should call it *inops* and I should designate the three principal race-like gradations of the species by calling *carduelis* or *inops* those series in which one of these two forms largely predominates, and by calling *universa* those in which they both occur in about equal numbers, and in which the extreme forms are unfrequent and transitional specimens constitute the mass. For instance, my series from New York and one from Bolognola, 1200m. (Central Italy) contrast greatly with a series from Sicily and with one from Algeria, so that the names *carduelis* and *inops* would be most necessary to designate these extreme differences; on the other hand neither one nor the other could be applied to series from Florence, because they are constituted by a form of about 50mm. in expanse, of an ochreous colour, with a carmine gloss, less bright than in *carduelis* (typical individual form of *universa*); according to localities and years a variable number of *carduelis* and *inops* are mixed with them. I have observed no seasonal dimorphism in the two broods. The underside of the hindwings show marked variations, which might be called: *INFRANIGRANS*, *INFRAGRISÆA*, *INFRABRUNNEA*, *INFRAOCHRACEA*, *INFRAFLAVA*; the first and last form are very rare, the former being similar to *P. kershawii* of Australia in that respect, and reminding one also of *indica*; the second is by far the most abundant in *universa*, the third in nymotypical *cardui*; the two last are found especially in *inops*. I have collected at Vallombrosa, 1000m., a specimen very similar to the aberration figured by Oberthür from Algeria in *Ét. Lép. Comp.*, fig. 2417; it is a transition to *ab. elymi*, Ramb., but, being much more frequent in nature, the name *EMIELYMI*, mihi, will be found useful to designate it. A few females have a supplementary white dot-like space below the row of apical ones (form *SEXIESUPILLATA*), and I possess one which actually has still another between the cubital nervures, as in the most usual female *atalanta* (*SEPTIESUPILLATA*). These names might be used also for the corres-

ponding *atalanta* forms; the first for exceptional females, the second for exceptional males.

Aglaia urticae, L., race *OPIMA*, mihi. Linneus's usual quotation fixes the Scandinavian race as nymotypical. It comes next to the arctic *polaris*, Stdgr., and transitional specimens to the latter are not unfrequent. In the southern parts of Central Europe such specimens on the contrary never occur, and the medium appearance of these races are distinctly different, on account of numerous individuals of the finest European form of the species, which is never seen northwardly. Still further south *turcica*, Stdgr., is generally distributed, smaller, more yellowish, and with several characters transitional to *ichnusa*, Bell., which on no account, however, is found outside Sardinia and Corsica, although many authors have affirmed the contrary on the ground of extreme *turcica* specimens; there is instead between the two a gap which is never surpassed either in nature or in experimental breeding. I propose taking the Alpine *urticae* of the Baths of Valdieri (Maritime Alps) as the type of the most robust and gaudy form and race mentioned above; I also possess it from Gèdre in the Pyrenees, and from Vendée. It is of a magnificent, bright fox-red, less deep than in the nymotypical form, but not as yellowish as in *turcica*; the yellow space near hind-margin of forewings is very much reduced or entirely obliterated; the black pattern is intermediate in extent between that of the two forms just mentioned, but the marginal lunules are very large and of a very bright blue. I think the name should be used in a general way for all the races in which transitions to *polaris* are not found on the one hand nor *turcica* on the other. In Central Italy *opima* is found amongst the *turcica*, but only once have I seen an *urticae*, L.

Eugonia polychloros, L., race *RUBENS*, mihi. I have in the *Ent. Rec.* for 1916, p. 101, remarked that the nymotypical form of this species is the smallest and most pallid one, much more frequent in the North of Europe, and I have described under the name of *pulchrior*, the large, bright form, most marked in South European races, taking as typical that of Tuscany (Florence). I must now add that there exists in Corsica, Sardinia, and Sicily still another race, which is a transition to the African *erythromelas*, Aust. It is larger than *pulchrior*, reaching 54 mm. in the male sex; the fulvous is decidedly redder, but never of the bright red tinge of *erythromelas*; all the yellow spaces are cancelled, except those between the external precostal spots and the lunules; the latter are broad and shadowed, recalling *xanthomelas*; the underside is very dark. I should call this form (and race) *rubens*, taking a specimen from Lanusei (Sardinia) as type; I also have similar specimens, but smaller, from Florence, where it occurs singly amongst the *pulchrior*, just as it does in Africa amongst the *erythromelas*.

Polygonia c-album, L. Linneus's first quotation makes the Scandinavian race the nymotypical one. His specimen is of no use in this sense, because geographical variation is about nil. I only notice that in the North of Europe there occurs a form quite unknown in the South, in which the ground-colour is pale and yellowish and the black

pattern very much extended: the external precostal spots are quite black, there exist some additional black spots in the hind-portion of the forewing and the pre-marginal lunules and bands are black, instead of being chestnut-colour. Form *PICTOR*, *mihi*; types from Petrograd and of the hybernating brood.

This species shows a very marked seasonal dimorphism, which I find to be quite constant. Some authors have affirmed the contrary, but I think this depends upon their not having separated the broods correctly; it must be born in mind that their times of emergence are very close to each other, and that individuals of the first still fly at the end of August, when the second begins to emerge. Some confusion has also arisen through a few authors calling the first brood of *Vanessidi* the hybernating one, and second the summer one. This method would have the advantage of better showing the analogy with the generality of *Rhopalocera*, and would be based on the epoch of reproduction, the name being maintained even when emergence, as in this case, takes place entirely in the autumn; it would be quite correct in the cases of *egea* and *polychloros*, which emerge partly in the spring, like some *Pieridae*, but on the other hand *cardui*, amongst the *Vanessidi*, would have decidedly to be reckoned in the opposite way to the rest, so that I conclude it is much better to keep to the method generally in use and to disregard the exceptions, which are only partial, of *egea* and *polychloros*. Anyhow, the use of "hybernating" and of "summer" brood will always make things quite clear.

As far back as 1881 Robson had named the summer generation *hutchinsoni* from English specimens, and it is surprising that subsequent authors should have entirely overlooked this name even in England, including the accurate Tutt in his *Hand-book of Brit. Butt.* Staudinger revived it and rightly applied it to the entire generation, sinking *pallida*, Tutt, and *lutescens*, Bath, in synonymy. Stichel, in Seitz's *Gross-schmett.*, let himself be influenced, evidently, by doubts on the constancy of dimorphism and restricted it to the females with the pattern extremely reduced and light ochreous underside; in the study of individual variation it is quite right to take this culminating form as the typical one, but the name should also be used, as it was meant by Robson, and as did Staudinger, for the whole brood. Tutt uses the name "*pallidior*, Pet.," for specimens with ochreous undersides, but it must be noted that Petiver (not Petagna, as interpreted by Wheeler) only used the word in his description: "*Eadem subtus pallidior*, the pale Comma," and never meant it for a name. Anyhow it could not stand, being previous to 1758, and Tutt's description alone stands, making it a synonym (1896) of *hutchinsoni*. Another name, which has been quite left in oblivion is that of *obscurior*. Baron Selys-Longchamps in his *Cat. Lép. où Pap. de la Belgique*, p. 18 (1887), calls *c-album* the "July" brood and *obscurior* the "September, March" one, showing he had separated them better than some modern authors. There is no other description but that contained in the meaning of the name itself, so that I suppose the name should not be considered valid. If it were, those who disregard the evidence of specimens labelled by Linneus might say that his description applies to both broods, and that if *hutchinsoni* exists in Scandinavia, as no doubt it does, Selys-Longchamps was at liberty to select this form as nymotypical, and *obscurior* should stand for the other.

Polygonia egea, Cr. Cramer figures a specimen with a dark band and a white space beyond it, across the underside. Stichel devotes a paragraph to this figure, concluding it is due to imperfect painting. I must observe that in Italy specimens coming very near it do exist, though they are rare. Esper's name *vau-album* should, I think, be used for the usual individual form with a more even pattern on that surface.

(To be continued.)

Notes on Cemiostoma wailesella and other Lepidoptera in Sussex in 1919.

By ALFRED SICH, F.E.S.

That vast collection of houses, known as Brighton, does not provide for the wants of many species of Lepidoptera, but several of those that may be classed as urban species do occur. The prevalent plant is *Euonymus japonica*, which supports *Abraxas grossulariata* in abundance, and also *Hyponomeuta cognatellus* this year in less numbers. *Bryophila perla* is not rare in some of the side streets and in certain suitable places along the front. *Gypsonoma aceriana* may also be seen in the neighbourhood of poplars. Three specimens of *Tinea pallescens*, quite a house-loving species, have been noted. Facing the sea at Kemp Town is a bank of evergreens where *Tortrix pronubana* has a settlement, while *Eucosma striana* haunts the tennis courts above. In June the town was invaded by a small army of *Tortrix viridana*, which were, however, mostly white by the time they got here. They were to be seen in the busy thoroughfares and one was found still alive at the very end of the West Pier. In St. Ann's Well Gardens, Hove, a few *Gelechia rhombella* were observed partly hidden under flakes of bark on apple stems, and later, on elm trunks after a wet and windy night, several nice forms of *Hypsilophus vittella* were taken, some ab. *carbonellus* and some approaching ab. *fissella*, while one or two were very light grey. The cliffs between Black Rock and Rottingdean are still fairly good, but a calm day is required for working there as they are quite exposed to the wind. Thyme, Trefoil, and *Centaurea* are perhaps the most attractive plants. In the middle of July *Homocidus sinuella* was on the wing, flying up from the herbage when disturbed but soon settling again, and later *Gracilaria tringipennella* was common, looking like a grey *Coleophora* when in flight. One warm afternoon, feeding on the patches of thyme, were many *Coleophora lixella* and *C. discordella*, but examination of several of these failed to reveal two other species which might have been among them. On another occasion *Cydia citrana* was in good condition and easily walked up. Some cocoons of a *Bucculatrix* were noticed on yarrow at the very edge of the cliff, and remembering that a rare species was once bred from this plant near the sea, I gathered them but they only yielded *B. cristatella*. In August *Laspeyresia rufillana* was taken among wild carrot, and an *Elachista atricomella* was found.

Earlier in the year *Cupido minimus* was abundant in the sheltered hollows on the cliffs between Rottingdean and Newhaven. On the whole Rhopalocera have not been much in evidence this year. On July 11th I went to Shoreham-by-Sea in the hopes of seeing *Lita instabilella* alive. When I got out on the flats among the *Atriplex* I found I

could not move without disturbing several. The moths were there in hundreds at least, but very shy and active, going away on the wind in dozens or diving down among the plants. They were most numerous on the slightly higher parts of the flats. The only other species noted was *Elachista argentella*, two or three among *Triticum*. Beside the Lewes road near Falmer there are some thick growths of yarrow. In July these were quite lively with the imagines of *Hemimene petiverella* and *H. alpinana* (*politana*). They fluttered or sat among the leaves in the afternoon sunshine. On the downs above the village are some patches of mixed bramble and gorse with those smaller plants usually found in such places. Here we noted *Schreckensteiniella festaliella*, *Eucosma striana*, *Acalla aspersana*, and the larvæ of *Nepticula acetosae* in their red spiral mines in the leaves of *Rumex acetosella*. This species evidently has a wider range of distribution than the old records allow, and probably will be found in many places if searched for. At Hassocks there is a walk beside the railway line and here early in the year *Euchloë cardamines* was abundant and *Asychna modestella* not rare at the flowers of stitchwort. In August I searched for the larva which feeds on the seeds, but the difficulty was to find the capsules as they were all hidden by the subsequent growth of herbage. The beginning of July would probably have been a better time to look for the larval cases. From a cocoon off birch *Salebria betulæ* was bred, and in August off birches I gathered some mines of *Lithocolletis*, but only bred *ulmifoliella*. However one of these was of interest. Most specimens of this species that I have bred have the fascia rather curved than angulated, but a moth taken among birch in Richmond Park, which otherwise agrees with this species, has a fascia distinctly angulated. The specimen mentioned above has the fascia angulated on the left wing and curved on the right wing. In a small wood near the station one *Batrachedra pinicolella* was seen on a pine trunk after a windy night, and later on the birch stems yielded *Eucosma betuletana* and some nice forms of *Cydia ramella*. In a sheltered corner of a meadow where rest-harrow and other plants grow, several *Acalla aspersana* were started on their short flights near the ground. The often common *Acalla variegana* has been scarce about here this season. There are some good fences along the road between Hassocks and Burgess Hill. On two or three occasions these were well frequented by micros. *Tortrix loeflingiana* was in great force and variety. A few *Eucosma salicella* were seen near willows, and *Cacoecia sorbiana* was noted, but rather on the hedges than the fences. *Coleophora fuscadinella* and *C. lutipennella* were common but *C. nigricella* and *C. gryphipennella* in less numbers.

I have never seen the elms mined to such an extent as they have been this year. In the hedges there is a good deal of dogwood in the leaves of which, here and there, the larval mines of *Antispila pfeifferella* could be seen. Near Keymer Mr. Ebray Sich took *Tinea nigripunctella* out of a hedge, and there were others on the wing, but we had no time to investigate. It is quite unusual to take the species so far from human dwellings. Ditchling Common may be reached by taking the train to the little station of Wivelsfield and walking up the road for a mile past good hedges, when the common comes in sight. One can then meander over the common and walk down another road to Burgess Hill. I have long wanted to find a spot like this where

Genista tinctoria is in profusion. Almost the first thing we found there were the cases of *Coleophora vibicella*. In searching for these a few cases of *C. saturatella* var. *tinctoriella* were discovered, but only two of these were bred, as the same parasites that decimated the *vibicella* had attacked them. These cases are of the same construction as those that are attached to broom, but are very light brown instead of being blackish. From a pupa taken off this plant the suffused form of *Depressaria costosa* was bred, but with one exception, to be mentioned below, we did not discover any of the other species that feed exclusively on *G. tinctoria*. The most conspicuous Tortrix seen on the common was *Eucosma rivulana* (*conchana*), a good series might have been taken. It was very lively but only remained on the wing a short time. In some spots *Achillea ptarmica* grows rather freely; among this I took one *Hemimene*, it may or may not be the local species which is attached to this plant. Several *Ancyliis biarcuana* were seen flying over dwarf sallow in the afternoon sunshine, and from mines off the same plant *Lithocolletis quinqueguttella* was bred. These underside mines curl up the small leaves longitudinally so that the margins meet. A few *Anarsia spartiella* were boxed and one *Ochsenheimeria mediopectinella* (*birdella*) was first seen on the wing and afterwards also boxed, all my previous captures of this species were made when the insects were at rest either on herbage or the trunks of trees. There is nearly always a breeze blowing over this common which is pleasant, but it may partly account for the general paucity of Lepidoptera, other than those mentioned, which was noticeable, at any rate, this year.

Here on June 10th we found some mines of *Cemlostoma wailesella* and also the empty ovum shell. The ovum is lozenge-shaped and laid singly on the underside of the leaves of *G. tinctoria* away from the ribs. The larva passing through the leaf forms a small black roundish spot under the upper cuticle, then mines a slender thread like track for a short distance, at the end of which it makes a much larger round blackish blotch, and finally a paler ovoid patch. The larva itself is extremely like that of *C. laburnella*. The cocoon is spun on the underside of a leaf, which is somewhat curved by the strain of the silk. The larva first spins two walls of white silk, one slightly higher than the other, afterwards the real cocoon is spun between the walls at the base of one of them. It will be seen from the description that the ovum, the peculiar mine, the larva and the curious cocoon are exactly like those of *laburnella*.* Stainton mentions the mine in the *Annual*. I have compared the cocoons of the two species side by side, and the only difference seems to be that those of *wailesella* are smaller, and its mines are distinctly of less extent than those of *laburnella*. The two species, as I think they are, must certainly be extremely closely allied. I bred a pair of *wailesella* on the same day and they paired. Afterwards I put some *laburnum* leaves in the box, but no ova were laid. A few days later I put in some fresh leaves, on these at least 20 ova were deposited before the moth died. The result of this experiment seems to show that the moth only used the leaves from necessity, otherwise, I think, she would have laid on the leaves first supplied. The imagines appear to be also smaller, but of the same whiteness as those of *laburnella*. The markings of the forewing vary

* Compare notes on *C. laburnella* in this Magazine, Vol. xxv., p. 182, &c.

in the same way in each species. The first costal bar in *wailesella* is often, not always, extended so as to touch or nearly touch the second costal bar, whereas in *laburnella* the first bar is often shorter, but I have seen specimens of this with the first bar nearly touching the second. Then the obliquity of the first bar is said to be greater in *wailesella*, but I cannot confirm this idea. I think the apical fringes in this species are more dusky. I have had no opportunity of comparing a long bred series of each species, nor have I been able to bring a microscope to bear on the various organs, when some differences might be discovered. *C. spartifoliella* is so close to *C. laburnella* that I doubt if certain specimens could be identified unless the food plant were known, but here the larva, method of mining (under bark) and cocoon are distinct. In the case of *C. laburnella* and *C. wailesella* the remarkable mine and cocoon are the same and the only difference seems to be in the size. Then again the leaf of *Genista* is much smaller than the leaflet of *laburnum* and this may have an influence on the size. That the ancestor of both species was no very distant one seems certain, and it would be interesting to know which of the two food plants is the older, if the botanists could tell us. The planting of *laburnums* for their spring beauty has caused a very wide distribution of *C. laburnella*, but the other species does not seem to occur in all places where its food plant grows. It is spread all over Ditchling Common, and in a garden adjoining the common are at least two *laburnum* trees which carry mines of *Cemiosoma*, so that imagines taken on the Common cannot be used for critical purposes. It is only the bred specimens that can be so employed, though there is little doubt that imagines taken about *Genista* in parts of the Common remote from these trees would rightly be considered as *C. wailesella*. On October 14th I went to Ditchling Common to find out where this species spins up for the winter. Only one cocoon was found and this was fastened to an old broken blade of grass among the rubbish lying at the foot of a *Genista* stem. I found no cocoons attached to the stems, as I fancied they might be. On this occasion I found no traces, except old cases, of *Coleophora vibicella*, but was surprised to see many small cases of *C. genistae* on *G. anglica*, as I had searched for these in vain last June. Many *Acalla reticulata* (*contaminana*) were disturbed from hawthorn bushes, but nothing striking was seen. It was equally common at Patcham a few days later.

Before concluding these notes I will mention that the colony of *Tortrix pronubana* was visited on October 3rd, a warm sunny morning. Five pairs and several others of both sexes were noticed, all sitting on the leaves of that *Veronica*, which is so commonly planted by the sea. When paired the ♂ is more than half hidden by the wings of the ♀. The only pair I saw on the wing appeared to be supported in its flight to the ground by the ♀. It could hardly be otherwise. The next day, at Rottingdean, I was pleased to take a specimen of *Platyedra vilella* as I had here previously searched for this species among mallow without success.

SCIENTIFIC NOTES AND OBSERVATIONS.

HYPONEPHELE LYCAON, Rott., and H. LUPINUS, Costa, TWO DISTINCT SPECIES.—On page 142 of this Journal I mentioned *H. lupinus*. The

Editors, without consulting me, added in: "(= *lycaon*, Rott.)." This is not correct. Turati [*Naturalista Siciliano*, XXI. (1909)], has accurately worked out these *Hyponophele* and shown that they are specifically distinct; in their extreme races (*lycaon* race *libanotica*, Stdgr., and *lupinus* race *rhamnusia*, Frr.), they have very different *genitalia* and *androconia*, besides other differential characters; they inhabit totally different grounds (barren summits and woods, respectively), and they are both found in Sicily. The race *intermedia*, Stdgr., belongs to *lupinus*, but decidedly comes nearer *lycaon* than does *rhamnusia*, and resembles it also in its habits. Several races of each species have been described, and they form two diverging series, the extremes of which are found, as stated, in the same region (Sicily); *intermedia*, however, is not a real transition, for it keeps well on the *lupinus* side, except for its haunts and superficial resemblance. I have found that the insect of the Florentine hills is *intermedia*, Stdgr., described from specimens of W. Asia, but found also in the Balkans and perhaps even in Spain, so that its occurrence in Italy is not surprising. Seitz in *Grossschmett. der Erde*, figures under the name of *lupinus* a male and female which exactly answer the Tuscan *intermedia*, but not the nymotypical *lupinus* of the forests of Terra d' Otranto (Guagnano) transitional between *intermediate* and *rhamnusia*; he then figures and describes *intermedia* in such a way that it does not differ in the least from the preceding; these blunders are most deplorable, especially in popular books. Count Turati's excellent paper and plates should be consulted, but I must point out that he uses the name *rhamnusia* for the species, whereas *lupinus* has the priority, as stated by Staudinger, who actually considered them synonymous.—R. VERITY, M.D.

ABRAXAS GROSSULARIATA AB. EXQUISITA AND AB. PULCHRA.—Adverting to my description of ab. *exquisita* of this wonderful species in your columns last autumn (vol. xxx., p. 189), I may say that I bred five examples last June of this extremely beautiful form. Of these one only is a female, similar to last year's seven females, but that her hindwings are not radiated. The other four are males, two with pure white ground colour, the other two slightly buff and with bronze radiations, being ab. *exquisita-aenea*. These all came from one family, viz., 41.18, the father of which was an *albipalliata* ex ♂ *lacticolor* × ♀ *flavipalliata* (of *varleyata* origin), and the mother an *exquisita*. I think, therefore, that, whatever may be the origin of Mr. Porritt's *exquisita* (if indeed his specimens are this), mine at any rate are, as I opined in my original article, the products of *varleyata*, *albipalliata*, and *iochalcea* (or *lacticolor*). Among other forms of *varleyata* that have appeared with me during the last two years is one I call *pulchra*, and I think the name is worthily bestowed on a form which is but slightly less attractive than *exquisita*, in that it has no white cuneate blotches on its outer margins. It resembles *exquisita* in its very broad white (or fulvous) mantle, of about twice the width of that in *varleyata*. Also, in my two new varieties the disc, which is large and striking, is situated in a sort of (white) recess trenching upon the broad black outer-marginal band. The latter, on reaching the costa, does not end suddenly (as in *varleyata*), but is continued conspicuously for a short space along the costa inwardly. Another striking difference is that, whereas in *varleyata* there is no white on the underside except exactly

beneath the white fascia on the forewings, both in *exquisita* and *pulchra* the underside is suffused with white over about two-thirds of its area. Altogether I have bred about a dozen *pulchra* (occurring mostly in *exquisita* families) including one with a yellow fascia. Should I next year breed an *exquisita* with an orange fascia my present aspirations would be satisfied.—(Rev.) G. H. RAYNOR, M.A., Hazeleigh Rectory, Maldon. October 30th, 1919.

NOTES ON COLLECTING, Etc.

PARARGE MEGERA IN ESSEX AND GLOUCESTERSHIRE.—In connection with Mr. Burrows note (p. 168) on this species, it may be useful to record that in a visit to Chignalls on the 23rd August last I found *megera* very common in the neighbourhood. I walked round from Chelmsford station through the fields and lanes to the Chignalls, and sometimes had 3 or 4 specimens, mostly males, sporting and flitting along the path in front of me. In the Stroud district of Gloucestershire the species has been noticed commonly at the end of July and beginning of August during my visits of recent years, and it seemed particularly attached to stone walls dividing fields, especially on the footpath side where there was a footpath.—C. NICHOLSON, Hale End, Chingford.

SOME SUGGESTIONS TO MR. ASHBY ON SPECIMENS COLLECTED IN ITALY.—I was very interested in Mr. Ashby's notes, but a few names have struck me as possibly being incorrect: *Glaucopsyche melanops* would be quite new to Italy; is it not *cyllarus* race *pauper*, Vrtý? Is not *Hesperia alveus* instead an *armoricanus*, Obth., more likely at that altitude? Is not *malvae* instead *malvoides*, Elw. and Edw.? *H. malvae* in Italy is only found locally in the Alpine region. *A. coridon* found in June strongly suggests *aragonensis*, Vrtý., first brood, *coridon* only appearing late in the summer. *S. pruni* is an interesting catch for Italy, of which I should like confirmation.—R. VERITY, M.D., Florence.

SAINT MARK'S FLY (*BIBIO MARCI*).—Some black flies which were swarming in our neighbours'—the Misses Jarman—garden on May 7th, were sent by me to Mr. Guérmonprez, of Bognor, for naming, and he kindly identified them as *Bibio marci* (Saint Mark's Fly), so called from their appearance about St. Mark's Day, April 25th. Their food is decaying vegetation and manure. He did not think them injurious. Noticing, however, that a bed of polyanthus flowers in our garden looked very sickly, our gardener dug them up, and the roots were found to be infested with a swarm of white maggots. These were removed and the plants soon began to recover. It has occurred to us that the larvæ may have been of this fly. Many were collected and placed in a tin box, with a view to rearing to the perfect state. Unfortunately all have died, and the species cannot be determined in consequence.—JOSEPH ANDERSON, Chichester.

SIREX GIGAS AT CHICHESTER.—A male *Sirex gigas* was taken here in our conservatory on July 3rd. The roof of this was being removed, and a new one put in in place of it. It is possible that the insect

emerged from the wood; instances of this have occurred.—JOSEPH ANDERSON, Chichester.

DAPHNIS NERII AT STUDLAND, DORSET.—On September 3rd my daughter found in the path a newly dead specimen of *Daphnis nerii* (Oleander Hawk-moth). Its head was crushed and the thorax a little knocked about as it might have been if killed by a bird and then dropped, but it was quite limp and fresh and otherwise in good condition. As I know its appearances in England have been of very rare occurrence and only after spells of warm, dry weather such as we had a short time ago, I thought it worth writing to you in case it is worth recording. When I return to town I should be pleased to bring the moth to show you if you would be interested.—HUGH G. RIVIERE, 38, Abercorn Place, London, N.W. 8.

DORSET.—On July 23rd we started for Dorset for a combined motor tour and butterfly hunt, and after passing through Coventry, Warwick and Stratford-on-Avon, spent the night at Cheltenham, and the next day travelled via Bath and Wells to Dorchester, where we made the "King's Arms" our headquarters. In selecting Dorset for a holiday ground we were influenced by the desire to find *Agriades coridon* ab. *fowleri* and to see if it occurred along the ranges of chalk hills which extend from Swanage to Dorchester and beyond, but had our happiness depended upon *fowleri* we should have had a rather gloomy time. In the first place the season seemed to be rather a late one, and though we scoured the hills in several directions *A. coridon* was not met with until July 30th, when two males were taken between Bridport and Dorchester. Then a howling wind did not improve matters, and this persisted for about 10 days, making catching very difficult except in the sheltered hollows. The Dorset folk boast of this wind as one of their assets in keeping the county fresh and cool, but we could have dispensed with a good deal of it without tears.

On the 25th we visited Lulworth Cove and were soon busy among the *Thymelicus acteon*, many of which were already worn, the females being quite as bad as the males, but we managed to select a short series. On our second visit on August 2nd they were much more plentiful and in fresher condition, and we found them flying more freely on the top of the cliffs, than among the broken ground near the bathing tents. We kicked up one *Selidosema ericetaria* (*plumaria*), but no *A. coridon* were met with. The sea was a glorious blue, and it was pleasant to renew acquaintance with the yellow horned poppy, samphire, and other sea-loving plants.

On July 31st we went over to Swanage. *A. coridon* was by no means plentiful and males only were seen, but among them was the only specimen of *fowleri* taken during the trip. A second visit was made on August 4th, and a third on August 6th, but only ordinary forms of *A. coridon* could be turned up. None of the Dorset females showed more than the slightest sprinkling of blue scales. Two or three *T. acteon* were noted near the lighthouse at Swanage.

On July 28th we tried a wood off the Weymouth Road, but found only *Dryas paphia* and *Argynnis aglaia*, with swarms of *Melanargia galathea* (the latter being very plentiful in almost every locality we worked), and went on to Weymouth and the Isle of Portland. Among

the stone quarries we found *Plebeius aegon* male and female in good condition and took a short series, but they did not differ much from those taken later on the heaths near Moreton and Corfe Castle. In Tutt's *British Butterflies*, Bankes is quoted as saying that in Dorset females appear never to exhibit any blue colouring except for a few scattered blue scales occasionally to be seen at the base of the forewing, but this is hardly correct as in the short series taken several have a considerable amount of blue scaling on both fore- and hindwings, and in two specimens the blue extends as far as the orange row of lunules. Some females are fuscous on all wings, but some have the orange lunules strongly marked on the hindwings and faintly on the forewings. The males also vary considerably in colour, the majority being purple, but a few having almost the blue of var. *masseyi*. The smallest male only measured 21mm., and one or two have the black spots in hindwings well developed. One male has basal spots to the underside of forewings. This appears to be the ab. *unipuncta* (Mousley) but the spots in this case are double, the upper one round, and the lower one a streak with a white border. Another male has the discoidal spots on upperside of forewings and more faintly on the lower wings. Several visits were made to Maiden Castle, a splendid earthwork about two miles from Dorchester, the camp being nearly a mile in length with ditches about 90 feet deep.

Our first visit was on July 27th, when no *A. coridon* were to be seen, but later it became fairly plentiful, though females were always scarce. A very large number of males were carefully examined for discoidal spots (var. *torquiensis*), which are said to be not uncommon, but only one was found and this would be more exactly described as a thin line than a spot. Several males were taken with faint orange spots on the upperside of hindwings, but no strongly marked specimen was met with. I have found no trace of this marking in any of my Herts specimens.

On August 7th my brother took a fine male *A. coridon* ab. *striata* at Maiden Castle, and on the same day I took a *Polyommatus icarus* male in which the upper submedian spot is extended into a long streak towards the upper basal spot, which seems to be rather an unusual form. The submedian spots in the upper wings are also in a much straighter line than usual, and the basal spots almost invisible. Another male is quite without basal spots in upper wings (ab. *icarinus*). I was surprised to find a large proportion of the female *P. icarus* strongly marked with blue some being equal to those taken at Grange and Loch Awe, as I thought the usual southern form was brown with very slight blue scaling. *Rumicia phlaeas* was not uncommon at Maiden Castle. One very dark male and females measuring 34mm. were taken, but no striated form could be met with.

I had always looked upon *Hipparchia semele* as a wary beast to be met with but not always taken on stony and difficult ground, but in Dorset it swarmed in incredible numbers in many places, and would almost settle on your boots. As is often the case when an insect is extremely plentiful, we did not pay sufficient attention to it, but among samples taken are one or two males nearly black, and one male from Lulworth with very light and bright patches on the lower wings. A bleached but badly torn *Epinephele jurtina* was taken at Swanage and also a *Coenonympha pamphilus* with one bleached wing. A con-

siderable number of *E. tithonus* were examined, but beyond a male with two black spots below the usual eye spots and a female with very strongly marked spots on lower wings, nothing striking was taken. Among the *A. coridon* are two specimens with wavy outer margins to the forewings.

The homeward journey was made via Winchester, Oxford, and Leicester, and samples of *A. coridon* were taken from Winchester and near Wantage, but only quite ordinary forms could be turned up.—DOUGLAS H. PEARSON, Chilwell, Notts.

NOTES ON ENTOMOLOGY IN FRANCE AND ITALY IN 1918.—July 31st.—This afternoon I took a very fine specimen of *Satyrus briseis* in the garden of the Villa, together with *S. hermione*, *Pararge aegeria* (fresh brood), and a fresh or late emergence of *Melitaea phoebe*. The greater part of July was so hot that much collecting was quite impossible, and no doubt I have missed some species. The whole district is undoubtedly rich in both its entomological and botanical fauna, but it is quite impossible to note everything in this month in any one season owing to the heat of the climate. I should say that the *S. briseis* was the only specimen I saw throughout my stay.

August 3rd.—Last night *Plusia bractea* and *Malacosoma neustria* came in to the light, and this evening a large portion of the hillside to the right of Monte Spineto had caught fire and the scrub and timber burnt fiercely aided by the strong sirocco which blew hard all day.

August 4th.—Up as far as the little cemetery in the gorge to the right behind the village of Vocemola. *Polyommatus icarus* was extremely abundant, and fresh imagines of *Leptosia sinapis* were now on the wing, the females of which in this brood have no markings whatever above, and many are of large size. *Melitaea dia* was flying on the hill pasture, and of *Hesperia comma* I took one specimen, the first so far. In the bed of the river, where many plants have sprung up, the little *Aricia medon* is quite plentiful, whilst on the tree trunks near the Villa *E. antiopa* and *Polygonia c-album* were taken. Although there was practically unbroken fine weather by day since about June 25th, the weather to-day attempted a thunderstorm, but after a slight shower and a cooler atmosphere it has apparently quite recovered.

August 5th.—I had the opportunity to-day of visiting Genoa, and was much interested in this ancient port and its cathedral of San Lorenzo, with the more magnificent church of Santissima Annunziata del Vestato. In the afternoon I made my way to the Museo Civico di Storia Naturale, near the Piazza d'Armi, which contains the best natural history collection in the city, although there is another in the Palazzo dell' Università. The Director of the Museo Civico, which was closed to the public and being used as a Red Cross Hospital, received me with much kindness, and I was permitted to see as much of the Lepidoptera as my time allowed. The local collection of Liguria is very strong in Sphinges and *Arctiidae*, but in general a great deal remains to be done in completing the collection of Lepidoptera, which is well housed with plenty of space, and the assistant is keen for its advancement.

August 6th.—I went along the hillsides and the entrances to the first and second gorges, and found *Plebeius aegon* still quite fresh, while *C. hera* was now in numbers. *H. comma* was getting common and the second brood of *L. camilla* well out, but a windy day with little sun gave less results.

August 7th.—*L. camilla* was in the garden to-day, and several were taken. The second brood seems much more common than the first. A fine female *Issoria lathonia* was taken on a clover blossom, and in the Villa a large female *Ocneria dispar* just emerged.

August 8th.—A fresh specimen of *Catocala nupta* was found indoors this morning, and I attracted a large number of males with the *O. dispar* female I took on the 29th. I was able to select as many males as I wanted in perfect condition.

August 10th.—The garden to-day yielded a female *Everes argiades*, the short-tailed blue, as well as specimens of *L. camilla*. On the hillsides the Lycaenids were settling on the few flowers which the hot sun had not caused to wither. *A. coridon* and *P. icarus* were still in good condition. *Pararge maera* and *H. comma* were still out and in good condition.

August 11th.—Near the entrance to the first gorge, on the right, in a clearing, *L. arion* and *C. hera* were taken, the latter wanted much selection now. Past the cemetery Lycaenids were swarming, especially *A. coridon*, and a fresh emergence of *A. thetis*. I also took a *Melitaea cinxia* with a good selection of *M. dia*. I saw worn specimens of *Epinephele tithonus*, the only ones I have so far met with here. Doubtless it is common in the plains. *Catocala electa* was still frequenting its rocky ledge by the river. It seems very abundant here. Higher up I took the Orthopteron *Oedipoda miniata*.

August 13th.—In the garden a fine female of the var. *cleodoxa* of *A. cydippe*, *S. stellatarum* and *H. comma*, besides the now regular habitué *L. camilla*. A female *Scolitantides orion* was also taken a short distance away. The hillsides were now so burnt up with the continuous strong sun of July and August that collecting was nothing like so easy as in the spring. One had to walk and walk until one was fortunate enough to find a clump of blossoms or some fresh grass in a sheltered spot, and in these comparatively few places a family of Lycaenids or of *Melitaea* would be met with. The *Pieris napi* now on the wing were remarkable for the almost complete absence of colour on the underside. The "green veins" being only of the faintest yellow.

August 15th.—I worked up the right bank of the river as far as the clump of trees to which I have alluded before. Just before reaching these over the short scrub growing on some stony ground, both sexes of *Satyrus arethusa* were flying in considerable number, and I took a very good selection, as it was the first time I had observed it on the wing. Working up the little gorge I struck the path leading from Vocemola to Pietrabbissara, but this time it yielded only *S. semele*, *Plebeius aegon* females, a male *A. coridon*, and a male *L. camilla*, with a small "emerald" moth. Earlier this path would no doubt be worth working. The return was made along the river bed, where the numerous pools left were visited, and specimens of *S. arethusa*, *C. edusa* females, *C. hyale*, and *Pontia daplidice* were annexed. Near Vocemola I took again the Orthopteron *Oedipoda caerulea*, which was numerous here, and also a specimen of *Decticus verrucivorus*. (*To be continued.*)—E. B. ASHBY (F.E.S.), Hounslow.

CURRENT NOTES AND SHORT NOTICES.

The *Bull. Soc. ent. Belg.* for August contains (1) the first part of an account of the *Dytiscidae* of Belgium analytically arranged with

notes on each species, by Van Dorsseleer, (2) the occurrence of melanism in *Lymantria monacha* for some years past, by Ch. Seydel, and (3) *Sphegides*, *Scoliides*, and *Mutillides* of the neighbourhood of Brussels, by Ed. Dubois.

We are pleased to see that *Leptosia sinapis* is holding its own in these islands. In the *Irish Nat.* for July-August the capture of this species is announced from both Co. Cork and Co. Wicklow. From our own knowledge we could give at least three localities in the south of England for this delicate species. The occurrence of *Carabus clathratus* in Co. Clare is a new record for Ireland.

The *Canadian Entomologist* for Aug.-Sept. contains an account of a visit to collect the various orders of the Arthropoda in the island of Barbadoes, British West Indies, in the spring of 1918, by Mr. and Mrs. Stoner. *Anosia archippus* L. (*plexippus*, auc.) and *Pyrameis cardui* represent the N. American fauna, while *Catopsilia eubule*, *Dione vanillae*, and *Junonia geneveva* represent the fauna of S. America among the few species of Rhopalocera met with. R. C. Treherne writes detailed notes on the Thysanoptera of British Columbia, with plates and illustrations. The remaining articles deal mostly with new species of Crane flies (Dip.) and Coleoptera, with biological notes on Hemiptera, Bees, and Coleoptera, and nomenclatorial notes on Microlepidoptera and Coleoptera.

Signor Querci writes from Italy that his wife and daughter have this year been to Sorrento, Formia where *Melitaea arge* was plentiful, Villalattina, S. Pietro Avellana in Molise, the Gran Sasso d' Italia, and the Sibillini mountains. For the most part Rhopalocera were not abundant anywhere, but the *Zygaenidae* have been the feature of the year and very nice series have been collected. On the Italian species and forms of this group Signor Querci has promised us a series of notes. That on *Zygaena transalpina* is already written and is being translated.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

August 14th.—DECEASE OF A MEMBER.—The death of Lieut. F. H. Wolley-Dodd, F.E.S., in the Dardanelles, was announced.

MELANIC SPECIMEN OF *C. AURATA*.—Mr. Blair exhibited black aberrations of *Cetonia aurata*, from St. Mary's, Scilly.

HISPULLA RACE OF *E. JURTINA*.—Mr. Turner, a series of large and bright *Epinephela jurtina* race *hispulla*, from the plains of Catania, Sicily, and a long series of *Adscita geryon*, from near Tring, Herts, where it had been very plentiful this season.

ABERRATIONS OF BRITISH LEPIDOPTERA AND INSTANCES OF LYING-OVER.—Mr. Buckstone, (1) *Boarmia cinctaria*, from the New Forest. (2) *Taeniocampa munda*, bred and captured, Oxshott, Wimbledon, etc. (3) *Adopaea flava* (*thauomas*), a dark ♀ taken at Boxhill on August 18th. (4) *Aphantopus hyperantus*, undersides showing gradation in colour and spotting, including ab. *arete*. (5) Larvæ of *Cosymbia pendularia*, from bred females of a brood of which some pupæ appeared to be going over. (6) He reported that seven out of ten pupæ of *Tephrosia luridata* were apparently going over.

A. LEPORINA AND H. PRASINANA.—Mr. Bunnett, specimens of *Acronicta leporina* and *Hylophila prasinana*, from Chislehurst.

THE SEASON.—Remarks on the season showed that Noctuæ were scarce, sugaring was a failure, honeydew had been very detrimental to larvæ, that a late frost had probably affected *Agriades coridon* badly, and that white butterflies and *Polyommatus icarus* were also scarce.

Aug. 25th.—VARIATION IN *H. MARGINATA*.—MR. B. S. Williams exhibited *Hibernia marginaria* (*progemmaria*), typical form Yeovil, ab. *fuscata* from Finchley and St. Anne's on Sea, with intermediate forms.

S. MENTHASTRI AB. *WALKERI*.—MR. Newman, a fine bred ab. *walkeri* of *Spilosoma menthastri* from Bexley.

H. CRINANENSIS FROM IRELAND AND *E. JURINA* AB. *ADDENDA*.—MR. H. J. Turner, for Mr. Greer, of Co. Tyrone, a long series of *Hydroecia crinanensis* taken at honey-dew on thistles, and a pair of *Epinephele jurina* ab. *addenda*, which appears to be a local race in Co. Tyrone.

OPILO MOLLIS AND *GRACILIA MINUTA* FROM SURREY.—MR. Ashdown, a rare beetle *Opilo mollis*, also *Gracilia minuta*, and stated that one of the specimens was the smallest he had ever seen. All were from Surrey.

ABERRATIONS OF BRITISH LEPIDOPTERA.—MR. Sperring, soft grey forms of *Boarmia repandata* from Scotland, *Agriades coridon*, ♂s with much black suffusion, and a *striata-obsolata* form, and a varied series of *Aglais urticae*, Paisley.

NEW FOREST VANESSIDS.—MR. Johnson, several examples of *Limnitis sibilla* almost completely black, and aberrations of *Dryas paphia* with very considerable coalescence and elongation of the usual markings.

LARVA OF *A. LEPORINA*.—MR. Bunnett, a larva of *Acronicta leporina* feeding on oak.

AMERICAN PAPILIOS.—MR. Edwards, *Papilio protodamas* (*hyperion*), *P. phaeon* ab. *ulopos* and *P. philenor* ab. *acauda* from S. America.

THE SEASON.—Reports of the season were made by several Members.

September 11th.—LECTURE.—MR. F. W. Thornington gave a lecture on "Variation in the British Ferns," with a large number of exhibits of abnormal growths.

C. EDUSA AB. *HELICINA* AND *GLOTTULA ENCAUSTUS*.—MR. Hy. J. Turner, *Colias edusa* ab. *helicina* (clear lemon coloured) from Cyprus, and three bred specimens of the very local Noctuid *Glottula encaustus*, from Catania, Sicily, with notes.

September 25th.—LANTERN SLIDES.—Lantern slides were exhibited by Messrs. Lucas, Bunnett, and Dennis.

AN ATLAS MOTH.—MR. Step, for Mr. Miles, an Atlas Moth, 11 inches in expanse, from India.

AMERICAN HESPERIDAE.—MR. Turner, *Hesperidae* from Cordoba, Argentine, including *Hesperia americana* with *Colias lesbia* and var. *heloides*, and *Meganostoma caesonia*, the "dog-face" butterfly.

ILLUSTRATIONS.—MR. Ashdown, a book of coloured drawings of flowers, and a beautifully worked Japanese metal leaf with a fly, a minute tortoise and a snail upon it, all finely chased.

A SLOWWORM.—MR. Coppard, a small slowworm.

MELANIC *B. REPANDATA*.—MR. B. S. Williams, a melanic series of *Boarmia repandata* from Finchley.

GALLS.—DR. Chapman, some galls on dogwood.

Subscriptions for Vol. XXXI. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 [This subscription includes all numbers published from January 15th to December 15th, 1919.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14.

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Ten Shillings, and must be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14. Cheques and Postal Orders should be made payable to H. E. PAGE.

ADVERTISEMENTS of Books and Insects for Sale, or Books wanted will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14.

Subscribers who change their addresses must report the same to Mr. H. E. PAGE "Bertrose," Gellatly Road, New Cross, London, S.E., otherwise their magazines will probably be delayed.

New Cabinets and Apparatus.—Note: Finest make only, and best material only used.

12, 20, 30 and 40 drawer Cabinets in polished deal or mahogany. Specifications and prices on application.

Standard make Store Boxes, 10×8, 5/6; 13×9, 7/-; 14×10, 8/-; 16×11, 9/-; 17½×12, 10/-; postage 6d. extra. Special price by taking 12 or more of one size.

Insect and Egg Cases, Jointed Nets, Pins (Tayler's), Zinc Collecting Boxes, Setting Boards, Killing Tins, etc., etc.

Write for complete lists of set specimens, apparatus, larvæ and pupæ.

LEONARD TATCHELL, Lepidopterist, 43, Spratt Hall Road, Wanstead, E. 11.

Duplicates.—*A. immorata*, *P. affinitata*, *E. venustula* (4), *S. andrenaeiformis* (7), *S. sphegiformis* (3), *I. globulariae* (4), *I. statice* (10), *E. miniata* (2), and others.

Desiderata.—*M. bombyliformis*, *S. apiformis*, *S. craboniformis*, *S. formiciformis*, *S. ichneumoniformis*, *S. philanthiformis*, *S. chrysidiformis*, *L. pygmeola*, *L. muscerda*, *L. caniola*, *E. cribrum*, and many others.—*H. B. Sly, 45, Warnford Court, London, E.C.*

Duplicates.—Varleyata and other varieties of Grossulariata. *Desiderata.*—Good varieties and local forms. *Spilosoma urticae*, *Advenaria*, and other ordinary species to renew old series: Good Tortrices and Tineae.—*Geo. T. Porritt, Elm Lea, Dalton, Huddersfield.*

Duplicates.—Grossulariata var. *lutea*, *lacticolor*, *varleyata*, *fulvaticata*, etc. *Desiderata.*—Other extreme forms of Grossulariata, or good vars. of *Diurni*.—*Rev. G. H. Raynor, Hazeleigh Rectory, Maldon, Essex.*

Desiderata.—*Euchloe cardamines* from Ireland; also types of *E. cardamines* from Switzerland, Italy, S. France; var. *turritis* (S. Italy), var. *volgensis*, var. *thibetana*, and of *E. gruneri*, *F. euphenoides*, *E. damone*, and any palearctic species of the genus. *Duplicates.*—*Loweia dorilis* and vars., a few minor vars. of *R. phleas* (British), and many British lepidoptera.—*Harold B. Williams, 82, Filey Avenue, Stoke Newington, N.*

Duplicates.—*A. coridon* vars., including semi-syngrapha, *H. Comma*. *Desiderata.*—*A. coridon* var. *Albicans* (Spanish) and var. *Hispana* (do.), and good butterfly vars., especially from Ireland.—*Douglas H. Pearson, Chilwell House, Chilwell, Notts.*

Duplicates (all Clydesdale).—*Ethiops*, *Selene*, *Icarus*, *Phleas*, *Hectus*, *Mundana*, *Perla*, *Fulva*, *Nictitans*, *Tritici*, *Chi*, *Boreata*, *Cambrica*, *Belgaria*, *Immanata*, *Olivata*, *Tristata*, *Boreata*, *Mercurella*, *Angustea*, *Dubitalis*, *Ambigualis*, *Truncicolella*, *Drepanalis*, *Kuhmella*, *Fusca*, *Margaritellus*, *Hortuellus*, *Hyemana*, *Phryganella*, *Ferrugana*, *Solandrinana*, *Sponsana*, *Conwayana*, *Stramineana*, *Rivulana*, *Urticana*, *Ocotomaculana*, *Perlepidana*, *Vaccinana*, *Geminana*, *Herbosana*, *Myllerana*. *Desiderata*—Numerous, especially.—*A. A. Dalglish, 7, Keir Street, Glasgow.*

Duplicates.—*T. pruni* (very fair); *Moneta* (bred); *T. cratægi* (bred); *Lucipara* (bred); *Juniperata* (bred); pupæ of *Bucephala*; ova *T. cratægi*. *Desiderata.*—Very numerous, to renew and extend.—*Wm. Foddy, 39, York Street, Rugby.*

CHANGE OF ADDRESS.—*L. A. Bor, 35, Great James Street, W.C. 1.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. 1919, Nov. 19th; Dec. 3rd.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—Hon. Sec., Stanley Edwards, 15, St. German's Place, Blackheath, S.E. 3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society).—Hall 20, Salisbury House Finsbury Circus, E.C. The First and Third Tuesday in the month, at 7 p.m. Visitors invited. Hon. Sec., J. Ross, 18, Queens Grove Road, Chingford, N.E.

All MS. and editorial matter should be sent and all proofs returned to **HY. J. TURNER**, 98, Drakefoll Road, New Cross, London, S.E. 14

We must earnestly request our correspondents *NOT* to send us communications IDENTICAL with those they are sending to other magazines.

Lists of **DUPLICATES** and **DESIDERATA** should be sent direct to **Mr. H. E. Page**, Bertrose, Gellatly Road, New Cross, S.E. 14

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.

Full List of Ova, Larvæ, and Pupæ, also Lepidoptera, Apparatus, Cabinets etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

G. A. Bentall, F.Z.S.,

~ NATURALIST ~

10-drawer Deal Entomological Cabinets, lift off glazed tops, £6 10s. 0d.

20-drawer ditto, also with lift off-glazed top Drawers, $17 \times 15 \times 2''$, £21.

40-drawer New Entomological Cabinets, with Mahogany panel doors, £70 each.

Carton Store Boxes. $15\frac{1}{2} \times 10\frac{1}{4} \times 2\frac{1}{8}''$, wood sides, hinged lids, cork bottom. 3s. 9d. each.

Postal or Store Box. $7\frac{1}{2} \times 12''$ Wood sides, cork bottom, lined white. 1s. 4d.

Best Pine Store Boxes. $13 \times 9''$, 7s. each; $14 \times 10''$, 8s. each; $16 \times 11''$, 10s. each.

Whitewood Double Store Boxes. $14 \times 12 \times 3''$, 9s. 6d.; $17 \times 12 \times 3''$, 11s.

Whitewood Travelling Setting Houses. $16 \times 12 \times 4\frac{1}{2}''$, hinged ends, 13s. 6d.

Pine Breeding Cages for low feeding larvæ. $16 \times 12 \times 7\frac{1}{2}''$, 7s. 6d., better quality, 10s. 6d.

Pine Larvæ Breeding Cage, with glass door, $16 \times 12 \times 12''$, 25s. each.

Superior Oval Cork Setting Boards.

$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4ins.
6d.	7 $\frac{1}{2}$ d.	1s.	1s. 3d.	1s. 4d.	1s. 6d.	2s.	2s. 3d.	2s. 6d.	3s.

Cork Sheets—

$19\frac{3}{4} \times 19\frac{3}{4} \times 3\frac{3}{16}''$	$11\frac{1}{2} \times 3\frac{1}{2} \times 1''$	$11\frac{1}{2} \times 3\frac{1}{2} \times \frac{3}{16}''$	$11\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{4}''$
2s. per sheet.	2s. doz. sheets.	3s. 6d. doz. sheets.	4s. 6d. doz. sheets.

Round Chipette Boxes, very strong—

$1\frac{1}{2} \times 1\frac{1}{2}''$	$1\frac{3}{4} \times 1\frac{1}{4}''$	$2 \times 1\frac{1}{2}''$
8d. doz.	10d. doz.	1s. 6d. doz.

Round White Metal Boxes—

$1\frac{1}{2} \times \frac{3}{4}''$	$2 \times \frac{3}{4}''$	$2\frac{3}{4} \times 1\frac{1}{8}''$	$3 \times 2''$
6d. doz.	7 $\frac{1}{2}$ d. doz.	1s. 3d. doz.	1s. 9d. doz.

Glass Top Metal Boxes—

$1\frac{1}{2}$	$2\frac{1}{4}$	3	$3\frac{1}{2}$ ins.
3s. 4d.	4s. 4d.	5s.	7s. 9d.
$3\frac{1}{2}$ d.	$4\frac{1}{2}$ d.	$5\frac{1}{2}$ d.	8d.
			8s. 9d. per doz.
			9d. each.

Type Collections of British Noctuae and Geometrae. 100 6s. 6d., 200 17s. 6d., 300 30s., 400 50s.

British Micro-Lepidoptera and Coleoptera at same rates.

Price Lists post free for Books, Apparatus, British, Continental, and Exotic Lepidoptera, Coleoptera, Birds' Skins and Eggs.

DUDLEY HOUSE, SOUTHAMPTON ST. (opposite Hotel Cecil),
STRAND, W.C. 2.

15, 820
Subscriptions for Vol. XXXII. are now due.

Vol. XXXI.

No. 12.

The Entomologist's Record AND JOURNAL OF VARIATION

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.

GEORGE T. BETHUNE-BAKER,

F.L.S., F.Z.S., F.E.S.

M. BURR, D.SC., F.L.S., F.Z.S., F.E.S.

(REV.) C. R. N. BURROWS, F.E.S.

T. A. CHAPMAN, M.D., F.R.S., F.E.S.

JAS. E. COLLIN, F.E.S.

H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

JOHN HARTLEY DURRANT, F.E.S.

ALFRED SICH, F.E.S.

(REV.) GEORGE WHEELER, M.A., F.E.S.,

and

HENRY J. TURNER, F.E.S.,

Editorial Secretary.

CONTENTS.

	PAGE.
Notes on Coccinellidae, <i>G. B. C. Leman</i> (with plate)	213
The Myrmecophilous Lady-bird, <i>Coccinella distincta</i> , <i>H. Donisthorpe</i> , <i>F.Z.S., F.E.S.</i> ..	214
NOTES ON COLLECTING:— <i>H. bajulus</i> near Weybridge, <i>R. S. Mitford</i> ; Collecting in France and Italy, <i>Lieut. E. B. Ashby</i> , <i>F.E.S.</i> ; Late appearance of <i>Agriades coridon</i> , <i>S. A. Chartres</i> ; <i>P. c.-album</i> near Salisbury, <i>H. G. Gregory</i>	222
CURRENT NOTES AND SHORT NOTICES	226
INDEX	229
SUPPLEMENT:—The completion is still held over.	

DECEMBER 15th, 1919.

Price ONE SHILLING AND SIXPENCE (NET).

WITH PLATE.

Subscription for Complete Volume, post free

(Including all DOUBLE NUMBERS, etc.)

TEN SHILLINGS.

TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,

"BERTROSE," GELLATLY ROAD, NEW CROSS, S.E. 14.

Communications have been received or have been promised from Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, Parkinson Curtis, H. Donisthorpe, A. Sich, Dr. Verity, C. W. Colthrup, Rev. C. R. N. Burrows, Dr. T. A. Chapman, Capt. Burr, G. T. Bethune-Baker, E. B. Ashby, P. A. H. Muschamp, J. H. Durrant, Orazio Querci, W. B. Davis, Prof. McDunnough, with Reports of Societies and Reviews.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/5, 2/2, 2/6, 3/2. Folding Nets, 3/9, 4/3, 4/9. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 7d., 10d., 1/2, 1/10. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 9d. per four dozen, 1 gross, 2/-. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/7 per tin. Store-Boxes, with camphor cells, 2/3, 2/9, 4/6, 5/6, 6/8. Setting-Boards, flat or oval, lin., 6d.; 1 1/2 in., 8d.; 2 in., 10d.; 2 1/2 in., 1/-; 3 in., 1/4; 4 in., 1/6; 5 in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 10/6, 12/9; corked back, 15/9. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/9, 4/6, 5/6, 8/3. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/9 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3 1/2, 1/2 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/6. Glass-top and Glass-bottomed Boxes, from 1/3 per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d., 1/-; Blowpipes, 4d., 6d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families and for all insects liable to become greasy.

We stock various sizes and lengths of these Silver Pins which have certain advantages over ordinary entomological pins (whether enamelled black or silver or gilt).

NESTING BOXES of various patterns which should be fixed in gardens or shrub-beries by lovers of birds before the breeding season.

SHOW ROOM FOR CABINETS

Of every description for INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS &c.

Catalogue (84 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).
Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.

Bexley] - L. W. NEWMAN [Kent

Has for sale a superb stock of 1918 specimens in fine condition, including Varleyata; Bicuspis; Pendularia var. Subroseata; Melanic forms Lariciata, Consortaria, Consonaria, Abietaria; Irish forms Aurinia and Napi, fine vars. Tiliae, Yellow Dominula, etc., etc. Quotations and Insects sent on approval with pleasure.

Also a huge stock of fine PUPÆ and OVA.

Write for latest price lists.

NOTICE:—Owing to huge rise in cost of metal, etc., my **Relaxing Tins** are now **3/6** small and **5/6** large, post free.

GALLS AND PIERCED BRAMBLE AND BRIER STEMS.—MR. L. A. BOX would be very grateful for any sorts and quantities, with localities, from all parts of the United Kingdom.
80, Northampton Road, Croydon.

Notes on Coccinellidæ (with one plate).

By G. B. C. LEMAN.

1. In August last I took in the Putney district two aberrations of *Coccinella 11-punctata* which are not included in Mr. H. St. J. K. Donisthorpe's interesting monograph on this species (see *Ent. Record*, Vol. xxx., No. 7, pp. 121-128), and on his suggestion I venture to name them as follows :—

(a) *Ab. binisesqui-punctata*, n. ab.—This conforms to the type with the exception that the 2nd and 4th spots are wanting—one specimen taken on thistle Putney Vale, S.W., Aug., 1919. (See Plate V., fig. 1).

(b) *Ab. trinisesqui-punctata*, n. ab.—This also conforms to the type but the 3rd spot is wanting—two specimens taken on thistles at the same place. (See Plate V., fig. 2).

Incidentally I may mention that I took also a specimen with the 3rd spot wanting on the right elytron only, which suggests a stage in the evolution of this new aberration.

2. In the same month and district I also took with the type the following recorded aberrations of *C. 11-punctata*, viz., ab. *confluens*, Haw. (present in considerable numbers), ab. *cakiles*, ab. *9-punctata* (both in fair numbers), and ab. *tamaricis* (two); also a specimen with spots 4 and 5 confluent on the right elytron only, and six specimens with spots 2 and 3 confluent only, in each case on the right elytron, again suggesting stages in the evolution of the respective aberrations ab. *tamaricis* and ab. *confluens*. The process of evolution appears to commence with the right elytron.

3. In the New Forest district near Ringwood, Hants, earlier in August I swept up with type the following aberrations of *C. 11-punctata*, viz., ab. *confluens*, Haw. (six specimens), ab. *variegata* (one) ab. *cakiles* (one), and ab. *9-punctata* (one), and at Winchester, ab. *confluens*, Haw. (four). I have submitted all my specimens to Mr. Donisthorpe, who has kindly confirmed my identification of them and has always most generously given me every help in identifying my *Coccinellidæ* and other specimens of Coleoptera. I think it may be of interest to mention the finding of these aberrations as I do not think that so far ab. *cakiles*, ab. *tamaricis*, and ab. *variegata* are recorded for the British Isles.

4. I may add that in this district I have also taken a "freak" specimen of *C. 11-punctata* with spots 1, 2, 3 and 4 again wanting on the right elytron, which is the nearest approach to the ab. *tripunctata* I have so far succeeded in taking.

5. I took another "freak" specimen on September 10th, on the Ashted Manor Estate, attributable to *C. 7-punctata*. This curious specimen has the normal $3\frac{1}{2}$ spots on the right elytron but the left elytron is unicolorously black, but this is probably attributable to some injury in the larval or pupal state, as this elytron is somewhat deformed at the apex and margin.

6. Last year I took on potatoe haulm (a favourite habitat here for *Adalia bipunctata*) with type a specimen with the sutural basal spot

distinctly bifid, with two other basal spots, the central spots confluent and two more spots in the apical region. This interesting specimen the late Mr. W. J. Ashdown identified as an aberration of *A. bipunctata*, and as he was unable to find in his large collection of *Coccinellidae* an exact replica, my specimen is possibly unique, and as such worth recording.

I have also submitted this specimen to Mr. Donisthorpe, and as he considers it worth naming, and in fact first noticed it among my *Coccinellidae*, I should like to associate his name with it, and with his consent propose to name it:—

ab. *donisthorpei*, n.ab. (see plate v., fig. 3).

7. In April last in Trent Wood (a few miles out of Droitwich. Wores.) I took in decayed leaves in an oak wood at the foot of an oak stump a solitary specimen of *Anatis ocellata*, L., which Mr. Donisthorpe tells me is a new locality for this species.

8. It may be worth recording that on September 13th last I also took by beating an entirely black specimen of *Chilocorus bipustulatus*, L., on pine at Oxshott, and on the same day and place single specimens of ab. *9-punctata* and ab. *cakiles* of *C. 11-punctata*.

The Myrmecophilous Lady-Bird, *Coccinella distincta*, Fald., its Life History and Association with Ants.

By HORACE DONISTHORPE, F.Z.S., F.E.S., etc.

Coccinella distincta, Fald.

Coccinella distincta, Faldermann *Nouv. Mém. Mosc.* 5 404 (1837).¹
Coccinella magnifica, Redtenbacher *Tentamen Pseudotr.* 24 (1843).²
Coccinella septempunctata, Mannerheim *Bull. Mosc.* 1 87 (1843)³ [?].
Coccinella labilis, Mulsant *Séc.* 84-86 (1846)⁴; Newman *Zool.* 5 1864 (1847)⁵; Stephens *Zool.* 5 1865 (1847)⁶; Mulsant *Species* 1020 (1851)⁷; Sharp *Proc. Ent. Soc. Lond.* 1863 168⁸; Champion *Ent. Mo. Mag.* 4 187 (1868)⁹; 5 45 (1868)¹⁰; Rye *Ent. Ann.* 1869 8¹¹; 1870 40¹². *Coccinella distincta*, Rosenbauer *Stet. Ent. Zeit.* 43, 166 (1882)¹³; Sharp *Cat. Brit. Col.* 2nd edtn., 22 (1883)¹⁴. *Coccinella labilis*, Collett, *Ent. Mo. Mag.* 20 226 (1884)¹⁵; Wood, *Ent. Mo. Mag.* 22 163 (1885)¹⁶; Morris *Ent. Mo. Mag.* 25 36 (1888)¹⁷. *Coccinella distincta* Fowler *Col. Brit. Isles* 3 165 (1889)¹⁸; Donisthorpe *Ent. Mo. Mag.* 31 99 (1895)¹⁹; 32 45 (1896)²⁰; Walker *Ent. Mo. Mag.* 33 175 (1897)²¹; Donisthorpe *Ent. Rec.* 9 247 (1897)²²; Ganglbauer *Käfer Mitt.* 3 1007 (1899)²³; Donisthorpe *Ent. Rec.* 12 173 (1900)²⁴; *Trans. Ent. Soc. Lond.* 1901 367²⁵; *Trans. Leicester Lit.-Phil. Soc.* 6 226 (1902)²⁶; *Ent. Rec.* 15 12 (1903)²⁷; Champion *Ent. Mo. Mag.* 39 151 (1903)²⁸; Donisthorpe, *Ent. Mo. Mag.* 39 206 (1903)²⁹; *Vic. Hist. Sussex* 1 149 (1905)³⁰; Donisthorpe *Proc. Lancs.-Chesh. Ent. Soc.* 1905 37 43³¹; *Eur. Cat. Col.* 363 (1906)³²; Donisthorpe *Ent. Rec.* 20 283 (1908)³³; *Zool.* 446 (1909)³⁴; Wasmann *Zeit. Wissens. Zool.* 101 112 (1912)³⁵; Fowler and Donisthorpe *Col. Brit. Isles* 6 (Suppl.) 254, 326, 329 (1913)³⁶; Donisthorpe *Ent. Rec.* 26 42 (1914)³⁷; 28 35 (1916)³⁸; 31 22 (1919)³⁹; *Proc. Ent. Soc. Lond.* Read 7 v. 19⁴⁰; Read 4 vi. 19⁴¹.

Coccinella distincta, Fald., subsp. *labilis*, Muls., ab. *domiduca*, Weise.

Coccinella septempunctata, var. η ., Stephens *Mand.* 4 380 (1831)⁴².

Coccinella labilis, var. B., Mulsant *Séc.* 85 (1846)⁴³. *Coccinella distincta*, var. *domiduca*, Weise, *Zeits. Entom.* 7 108 (1879)⁴⁴; Ganglbauer, *Käfer Mitt.* 3 1007 (1899)⁴⁵. *Coccinella distincta* ab. *domiduca*, *Eur. Cat. Col.*, 363 (1906)⁴⁶; Donisthorpe, *Ent. Rec.* 28 35 (1916)⁴⁷.

Coccinella distincta, Fald., subsp. *labilis*, Muls., ab. *intertexta*, Weise.

Coccinella distincta var. *intertexta*, Weise, *Best. Tabln.* 109 (1879)⁴⁸; Ganglbauer, *Käfer Mitt.* 3 1007 (1899)⁴⁹. *Coccinella distincta* ab. *intertexta*, *Eur. Cat. Col.* 363 (1906)⁵⁰.

Coccinella distincta was described by Faldermann¹ in 1837, from Trans-Caucasica. His insect, which he figures, has only five spots on the elytra, and although this has to stand as the type form, it is in reality only an aberration in which spots 1 are missing. This so-called type-form is evidently very rare; there are no examples of it in the general collection at the British Museum, and it has never occurred in Britain. I have only seen a single specimen, which was taken by the late Mr. W. J. Ashdown, in Switzerland, some years ago in company with a number of examples all possessing 7 spots.

Redtenbacher², in 1844, again described the species, under the name of *magnifica*, from Austria. This insect also only possessed 5 spots. The *European Catalogue*³² treats this as an aberration of *distincta*, Fald., but I do not see any reason for this. His type, from the description, was a little larger, and the spots on the elytra were large—"maculis quinque magnis nigris." The beetle usually has large spots, and varies somewhat in size, and I consider that *magnifica*, Redt., is a synonym of *distincta*, Fald.

Mulsant⁴, in 1846, gave a very good description of this lady-bird, which he named *labilis*. He said that it was the *C. magnifica* of Redtenbacher, according to the examples sent to him by that naturalist, and that the latter, no doubt, made a typographical error in saying only 5 spots, since there are 7. I think it is much more probable that Redtenbacher described his type in the first instance from a specimen which had lost spots 1.

Later Mulsant⁷ (in 1851) stated that the *C. distincta*, Fald., was evidently the same as *C. labilis*, judging from an individual sent to him by M. de Motschoulsky. In that example, which he had before him, spots 1 were very small, showing by their small size a disposition to become effaced, and that Faldermann had described *C. distincta* from individuals in which these spots had disappeared.

This was no doubt the case. I took a specimen at Weybridge, on September 18th, 1918, in which spots 1 on the elytra are very small, evidently being such a specimen as that sent to Mulsant by Motschoulsky.

The *European Catalogue*³² treats *labilis*, Muls., as a synonym of *magnifica*, Redt.; but as we have seen, this is not correct. The only form found in Britain is the *C. labilis*, Mulsant, and I consider this form should be called *C. distincta*, Fald., subsp. *labilis*, Muls.

An aberration occurs which possesses 9 spots on the elytra, a small extra spot being present on each shoulder. This is the var. *domiduca*, Weise⁴⁴, *C. septempunctata* var. η , Stephens⁴², and *C. labilis* var. B., Muls.⁴³. It occurs in Britain, I having taken it at Woking, Weybridge, Bexhill, and in the Blean Woods. This should be called *C. distincta*, Fald., subsp. *labilis*, Muls., ab. *domiduca*, Weise.

There is also an aberration described as var. *intertexta* by Weise⁴⁸, from Russia, in which some of the spots are confluent. It has not been found in Britain.

C. distincta comes nearest to, and is superficially very like, the common 7-spot Lady-Bird, *C. septempunctata*, L., from which it differs, however, in many important particulars. The anterior angles of the thorax are more rounded and do not project so much in front; the elytra are longer in proportion and not so pointed behind, and their side margins are not so apparent, especially just below the shoulders, where, when viewed from above, they are almost invisible. The spots on the elytra are usually much larger. The epimera of the mesosternum and the apex of the episterna of the metasternum are white, whereas in *7-punctata* only the former are white. In this last character, however, *distincta* varies considerably. I took a specimen* at Weybridge, on July 28th, 1919, in which the underside is entirely black.

Dr. Sharp has kindly dissected the male genitalia of the two species for me, and he has found that they differ very greatly in this respect; those of *C. distincta* being very highly specialised. He considers that the enormous size of the stop-piece at the base of the median lobe, and the spatulate process from the distal margin of the tegmen, are very striking characters.

Rosenhauer¹³, in 1882, described the larva and pupa of *distincta*, and compared them with those of *septempunctata*. As I have never, as far as I can remember, seen the larva and pupa of the latter, I give the differences as stated by Rosenhauer. The larva of *distincta* is somewhat more robust, and the red-yellow colour is more in evidence. The head is more broadly light behind, and the prothorax at the sides. The two other thoracic segments, as well as the sides of the first abdominal segment are marked with a large light spot; other larvæ are entirely light, reaching to the tubercles. The larva of *7-punctata* becomes a pitchy-grey before pupation, that of *distincta* a grey-yellow.

The pupa of *7-punctata* has mostly a predominant black coloration, and the elytra are half black; still this varies so that the wings towards the inner side and apex are black, the shoulder spot free, or with the colour smeared, or the elytra quite red, with three small spots showing, but the shoulder spot is always distinct.

The pupa of *distincta* is always of a red colour with black spots, and very seldom is there a slight indication of a shoulder spot to be seen, the middle spot being always of a considerable size.

HABITAT.—*Coccinella distincta* is very widely distributed in Europe, and occurs in Central Russia and the Caucasus.

THE BRITISH DISTRIBUTION is as follows:—

Hants., S.: Brockenhurst (*Walker*); Hants., N. Pamber Forest (*Donisthorpe*)²⁷.

* This specimen is very curious;—the head is all black, the thorax nearly so, and the antennæ, although they consist of the normal number of joints, are so short that they cannot be seen from above, when extended. Moreover, it possesses a sharp chitinous spine, 1mm. in length, springing from the margin of the left elytron, at the shoulder.

Sussex, E.: Lewes (Morris)¹⁷; Guestling Wood (Collett)¹⁵; Bexhill (Donisthorpe)³¹; Abbots Wood (Vic. Hist. Sussex)³⁰.

Kent, E.: Kingsgate (T. Wood)¹⁶; Blean Woods (Walker)²¹; Whitstable (Champion)⁹; Sheppy Cliffs (Walker)²¹; Herne Bay (Dr. Sharp)⁸.

Surrey: Weybridge¹¹, Esher¹², and Horsell¹² (Dr. Power); Woking (Champion)²⁸; Farnham¹² (Dr. Power).

Essex, N.: Birdbrook¹² (Dr. Power).

Berks.: Crowthorne (W. E. Sharp),

Hereford: Leominster (Newman)⁵.

Worcester: Bewdley (Donisthorpe)³³.

This beetle was first recorded as British by Edward Newman⁵, in the *Zoologist* for 1847, who stated that he had taken it at Leominster some years ago, and had placed it in the cabinet of the Entomological Club, where it had remained unnoticed until Dr. Schaum, who was then in London, had called his attention to its specific characters.

In the same publication J. F. Stephens⁶ gave a description of the insect, and stated that he had been able to muster up seven examples of this new British *Coccinella*, but he thought that he had placed two or three specimens in the British Museum Collection in 1816.

On September 7th, 1863, Dr. Sharp⁸ exhibited a specimen at the Entomological Society of London, taken by himself at Herne Bay a week previously.

Champion⁹ next records it in 1868, having swept it in woods between Whitstable and Canterbury in 1866, 1867, and 1868.

It was subsequently taken, as is shown in the British distribution, in various other localities in Britain by other Coleopterists.

ASSOCIATION WITH ANTS.—It may be stated at once that *C. distincta* is only to be found in the immediate neighbourhood of ants' nests, and in this country with *Formica rufa*. The first time in literature that this Lady-Bird was mentioned as actually being connected with ants was in 1888, when C. H. Morris¹⁷ recorded it from near Lewes. He writes: "On June 2nd I came across this rare beetle rather commonly in a clearing of one year's growth; it was a warm sunny day, and they were to be taken in various ways, some by sweeping, others crawling on the ground, or up the trunks of the trees, while many were flying round the nests of *F. rufa*, accompanied by *Clythra quadripunctata*. It would be interesting to know if this insect has been taken in a similar way before; they appeared to be very local, although not uncommon in this particular clearing, in the vicinity of the nests, as we found about 50 specimens in the course of an hour or so." This note is headed "*Coccinella labilis*, Muls., attached to the nests of *Formica rufa*."

Champion's¹⁰ remarks on his capture near Whitstable are significant: "They were confined within the space of a few yards, on a few plants growing at the side of a narrow path; and searching the woods for miles in other directions failed to produce any more."

With our present knowledge we know at once that there was a nest of *Formica rufa* situated on that spot beside the path.

Collett¹⁵, in 1883, found the beetle in some numbers, and he says, "The locality was the wood at Guestling, where I worked the nests of *Formica rufa*." He, however, failed to draw the natural inference.

Fowler¹⁸ says it is found in sandy places, by sweeping heath, etc., and gives the then known British distribution. He mentions "Lewes, in and about ants' nests," from Morris's record; but it was not yet realised that this Lady-Bird was *only* to be found with ants.

Donisthorpe¹⁹ recorded it with *Formica rufa* in 1895, and in 1896 he²⁰ gave it as one of the regular guests of that ant.

Walker²¹ found it, in fair numbers in the Blean Woods in 1897, "chiefly on young shoots of oak and birch in the vicinity of nests of *Formica rufa*."

Champion²⁸ captured two specimens in 1903, at Woking, in the pine woods, running on the ground in company with *Formica rufa*.

The late W. E. Sharp, in one of his last letters to me, told me he took some four or five specimens in the runs of *F. rufa*, in July, 1915, at Crowthorne.

The above (with the exception of the rest of my own rather numerous records ^{22 24 25 26 27 29 31 33 34 35 36 37 38 39 40 41 47}) appear to be the only occasions when it has been published as being found with ants in Britain.

On the continent it is probable that the single example of *C. 7-punctata* recorded from Finland, in 1843, as being taken with *F. rufa* by Mannerheim³, may have been really *C. distincta*. The first real record (and the only one as far as I am aware) of this Lady-Bird being attached to ants on the continent is by Wasmann³⁵, in 1912. He writes:—

" I have convinced myself that it belongs to the regular myrmecophiles. In 1900 H. Donisthorpe reported its regular presence with *Formica rufa* at Weybridge, in England. He also made experiments with it, and noted that it was indifferently treated by the ants, while the very similar *septempunctata* was attacked by them. In the neighbourhood of Luxemburg town I found during the last ten years *Coccinella distincta*, but only always in the close neighbourhood of ants' nests. With *Formica truncicola* it was commonest, a little rarer with *F. pratensis*, with *Polyergus rufescens* with *F. rufibarbis* as slaves, with *Myrmica laevinodis* and *Camponotus ligniperda*." It is true, he states, that in 1894 [*Krit. Ver. Myr. Ter. Art.* (1894)] he held "its presence with ants only to be accidental"; but as a matter of fact he never mentioned it by name, and only wrote of the *Coccinellidae* (l.c., p. 161): "Regular myrmecophiles of this family are not known to me with certainty."

I first captured *C. distincta* on March 29th, 1894, in the High Woods at Bexhill, when it was crawling on the hillocks of *Formica rufa*, and sheltering under dead leaves on the nests; and I have found it with this ant in various other localities, and continuously at Weybridge ever since. In the last named locality it has occurred in every month in the year, on the nests and all trees and plants (Scots fir, birch, oak, willow, and heather, etc.) in their vicinity, and also flying round the ants' hillocks, often in company with *Clythra quadripunctata* in hot sunny weather. I give a complete list from my myrmecophilous note books, of all the localities and dates I have seen the beetle in nature.

In company with *Formica rufa*, Bexhill, 29. iii. 1894. Weybridge, 28. ix. 1894: 19. iii. 1895: 20. iv. 1895: 29. v. 1895: 20. iii. 1897. Blean Woods, 11. v. 1901. Pamber Forest, 20. iv. 1902. Weybridge,

26. iv. 1902: 22. ii. 1903: 13. v. 1906: 7. iv. 1908: 9. v. 1908. Bewdley, 31. v. 1908. Blean Woods, 22. vi. 1908. Weybridge, 5. vii. 1909. Bewdley, 22. vii. 1909. Woking, 21. v. 1913: 4. vi. 1913. Bewdley, 7. vi. 1916. Weybridge, 8. vii. 1916: 5. vi. 1918: 3. vii. 1918: 27. viii. 1918: 3. ix. 1918: 18. ix. 1918: 9. x. 1918: 14. xi. 1918: 28. xii. 1918: 27. i. 1919: 28. ii. 1919: 14. v. 1919: 21. v. 1919: 30. v. 1919: 25. vi. 1919: 8. vii. 1919: 11. vii. 1919: 15. vii. 1919: 24. vii. 1919: 28. vii. 1919: 12. viii. 1919: 16. ix. 1919: 18. x. 1919.

In 1900 I²⁴ pointed out that when *C. distincta* was walking about among many ants on the hillocks at Weybridge, it would now and again duck down flat. I introduced into the nests some of the common *C. septempunctata*; the ants which had paid no attention to *C. distincta* endeavoured to attack *C. septempunctata*. The latter ducked down also, and as the legs and antennæ in the *Coccinellidae* can be packed close to the body, the ants had nothing to lay hold of, their jaws slipping off the smooth surface of the elytra. When unmolested again the beetle walked on a little, and eventually got away. I stated that I was now sure that *C. distincta* belonged to the protected group of Myrmecophilous Coleoptera, and that its larva no doubt fed on the *Aphidae* and *Coccidae* that occur in the nests of *Formica rufa*.

This is not the case with the larvæ of *C. distincta*, as we shall subsequently see. Wasmann³⁵ states that the ant species, with which it is most frequently found (*F. rufa*, etc.), do not keep any *Aphidae* or *Coccidae* in their nests, but only seek such species to milk as occur everywhere outside their nests. He is not quite correct in stating that *F. rufa* keeps neither Aphids nor Coccids in its nests, as I have taken of the former—*Lachnus formicophilus*, a species discovered by me new to science, and only known from such situations; *Schizoneura corni*; and *Aphis plantaginis*; and of the latter—*Orthezia cataphracta*; and *Newsteadia floccosa* in *rufa* nests. They do not, however, occur in anything like sufficient numbers to serve as food for the Lady-Bird's larvæ.

Again, on April 21st, 1903²⁷, I made experiments with *C. distincta* and its treatment by the ants. Having introduced a specimen, which I had taken at Pamber Forest, into my observation-nest of *F. rufa*, the ants were unable to seize it, its defence being to retract the legs and antennæ and duck down, when the ants' jaws slipped off its shiny elytra. When an ant was forced to take hold of the beetle's leg, it let go at once. Another ant held on for some little time, dragging the beetle about. The Lady-Bird remained motionless with all the other legs retracted, and the yellow exudation, which is excreted by the *Coccinellidae*, was very apparent. The ant then let go and appeared to be very upset, walking round in circles, and was very languid for a long time afterwards, the beetle walking away unhurt.

The experiments with *C. distincta* and *C. septempunctata* were repeated last year (August 27th, 1918)³⁹ in nature, for the benefit of Mr. Blair, when he went with me to Weybridge, and he was much impressed by them. Specimens of both species were placed on the *rufa* hillocks among the ants. The former were only slightly attacked and quickly got away, but the latter were vigorously assailed; one specimen had its leg seized by an ant, and only after some little time had elapsed escaped with difficulty.

On May 31st, 1908³³, I observed specimens of *C. distincta* crawling out of a nest of *Formica rufa* at Bewdley, and a number of the Lady-Birds were found to be present about other nests. This was the first record for the Midlands. When publishing a note on this discovery, I stated, "My present view is that these beetles seek the nests of *Formica rufa* for hibernation, and leave in the spring or early summer." [My subsequent investigations, both in the field and with an observation nest at home, have failed to prove this theory.]

On July 3rd, 1918, I found, at Weybridge, the larvæ of *C. distincta* in some numbers, feeding on Aphids, attended by ants on a fir tree over a *rufa* nest. A number, most of them being nearly full grown, were taken home and placed on fir boughs, on which were plenty of Aphids, in my large *rufa* observation nest. They fed on the plant-lice, and on July 4th two of the larvæ had fixed themselves on the muslin over the nest, ready to pupate. One of these turned to a pupa on July 6th, and the other on July 7th. Others fixed themselves on the pine needles of the boughs, and some on the frame of the nest, and all were in the pupal state by July 9th. The two first to pupate became perfect insects on July 15th, having spent eight and nine days respectively in the pupal state. By July 20th all had reached the imago state. Some of these I set, and the rest I took down to Weybridge on my next visit and let loose. I may mention that the ants never paid any attention to the larvæ or pupæ. I now determined to try and find out if the *Coccinella* did hibernate in the *rufa* nests. Having planted a small fir tree in my large observation nest, and supplied it with Aphids, I brought up from Weybridge on August 27th, 1918, a number of the beetles and established them in my nest. The plant-lice soon died off, or were devoured by the beetles; but I found the latter would eat the honey supplied to the ants, often sitting among the ants feeding on the honey. They spent the whole winter on the fir tree and about the nest; a certain number disappeared, but the rest were present in February, the ants having retired into the sand beneath the débris of the nest long before this, when it first got cold. The nest was kept in a room at the top of the house, with no fire, which of course was very cold during the winter.

On November 14th all the ants in the *rufa* nests at Weybridge had gone to ground for the winter, but the Lady-Bird was still abundant on the trees over the nests.

On February 28th, 1919, I went down to Weybridge and dug up the *rufa* nest under the fir tree, where I had found the *Coccinella* larvæ the year before, which, being in the shade, showed no signs of life. (The ants of another nest, which was in the open, were coming up and massing in the sun at the entrances to the nest.) The ants in the first nest were right below the hillock, in earth chambers, some 2½ feet down, and I found one Lady-Bird with them, dormant, but quite alive. When placed in a box it soon became active. Others were as usual on the trees over the nests.

On March 1st I dug up my nest at home, but the most careful search only produced one of the *Coccinella*, which was with the ants in the sand beneath the hillock of the nest. It would thus appear that a few specimens may hibernate in the nests, but the great number pass the winter in the trees over them.

The next step was to find the eggs of the insect, when, where, and

how they were laid. May 14th found me again at Weybridge, and the day being very hot many of the Coccinellids, which were abundant, were flying about round the nests and trees in company with *Clythra quadripunctata*. The copulation of several couples was observed—the male sits far back on the female, his front tarsi resting on the large black central spots on her elytra, his body vibrating now and then. It being evidently a little too early for the eggs, several couples were taken home and placed in a large box with a glass lid, and supplied with fir-boughs, plant-lice, and honey.

My next visit to Weybridge was on May 21st, in company with my colleague, Mr. Crawley, and after a long hunt I found a bunch of eggs on the underside of a pine-needle. The eggs were long and of a bright yellow colour, and were laid in rows like a lot of little barrels placed close together, two and three abreast. As far as I am aware the ova of this beetle had never been found before. As no more were seen by either of us, after the most careful search, it was probably still somewhat early for the eggs. On May 30th, however, I was more successful, clusters of eggs being found on fir, birch, and oak trees over *rufa* nests, always on the underside of the leaves, or pine needles; the number of eggs present in a bunch varied—7, 12, 14, and 20 being noted. About 1 o'clock a female was observed laying eggs on the underside of a leaf on a young oak tree, round which a large *rufa* hillock had been built. After laying an egg she advanced a little and laid another just in front of those behind, 20 in all being laid. When she had finished she walked quickly away, and I captured her. This female laid more eggs on June 3rd, in captivity, and these eggs hatched on June 8th. Some of the Lady-Birds, in captivity in the glass-topped box mentioned above, laid eggs; but these were always devoured by the others. Copulation was also noted in captivity on June 7th; on this occasion the female swayed rapidly from side to side every now and then, as if she wished to shake off the male.

I was successful in rearing two specimens right through from the egg to the perfect insect. This was only accomplished with considerable difficulty. I tried them on fir-boughs placed in water, but the Aphids on the boughs soon died, or fell off, as did also the young Coccinellid larvæ; in plaster nests, but if kept too damp they died when moulting, and if too dry they died at once; they also devoured each other. Eventually I kept each larva by itself in a small glass-topped box, with a little wet cotton wool to keep the atmosphere moist, and this required to be damped frequently in the hot weather. I supplied them with any plant-lice I could get hold of—off fir, birch, oak, mountain ash, nettles, rose trees, and ivy. They did not appear to care for the rose Aphis much, but devoured the ivy species very readily.

The following is the time table of the two specimens successfully reared:—

A. Eggs on the underside of a pine-needle (probably laid the day they were found) found at Weybridge May 21st, 1919.	B. Female observed laying eggs on the underside of an oak-leaf at
Hatched May 25th.	Weybridge, May 30th, 1919.
1st Moults May 30th.	Hatched June 6th.
2nd Moults June 4th.	1st Moults June 10th.
	2nd Moults June 15th.

3rd Moulth	June 12th.	3rd Moulth	June 18th.
4th Moulth	June 15th.	4th Moulth	June 21st.
Larva fastened up ready to pupate,	June 22nd.	Larva fastened up ready to pupate,	June 23rd.
Pupa,	June 22nd.	Pupa,	June 28th.
Perfect Insect,	July 9th.	Perfect Insect,	July 11th.

The newly hatched larvæ are of a dark bluish-grey colour, and after the first moult yellow spots begin to show. After the fourth moult they are dark blue with very distinct yellow spots. Before pupating the colour changes to grey. The pupa is at first bright yellow, which changes to a delicate pinkish yellow, with darker light violet-grey marks, which later become black. When the perfect insect has first emerged from the pupal skin, it is a very light yellow, the thorax being a little darker, and the wings are extended. In about two hours the wings are withdrawn beneath the elytra, and the insect acquires the normal colour in about 24 hours.

One other larva got as far as to fasten itself up ready to pupate, but it never changed to a pupa.

The larvæ are very voracious, and devour large quantities of *Aphidæ*, and I imagine the differences in the times spent between the moults, etc., depends on the amount of food they were able to obtain, and probably also on the weather. The egg measures 1.8 mm. in length, and .5 mm. in the centre. It is of a bright yellow colour, and narrowed towards each end, being slightly broader and more rounded at the upper, than at the lower end. It is covered with a thin membrane, which forms a flat round disc at the lower end, where it is fastened to the leaf on which it is laid.

The full-grown larva measures from 10.5 mm to 11 mm. in length; and the pupa from 6 mm. to 6.5 mm. in length.

Fowler¹⁸ gives the length of the imago as 5.5 mm. to 7.5 mm.; and Ganglbauer²³, 5.5 mm. to 8 mm. The smallest specimen I have taken measures 6.5 mm., and the largest 8.5 mm. in length.

Rosenhauer¹³, in the paper before mentioned, states—"Truly only one generation occurs." I believe this to be the case as a rule, but this year, perhaps on account of the very hot weather in the early summer, there appear to have been two generations. On August 26th, 1919, I was unable to find any imagines (this is the only time I have ever been to Weybridge and not seen the perfect insect when I have looked for it); but larvæ, of all sizes, were abundant on the trees over the nests. As we have seen eggs were laid in May which produced beetles early in July. The eggs from which these August larvæ hatched, must have been laid at the end of July and the beginning of August.

(To be concluded.)

NOTES ON COLLECTING, Etc.

HYLOTRUPES BAJULUS NEAR WEYBRIDGE.—In August last, while searching for Coleoptera in the neighbourhood of Weybridge, I was fortunate enough to meet with *Hylotrupes bajulus*, L., again. My first capture of this fine Longicorn in this vicinity was made in my garden and duly recorded by me in the *Ent. Mo. Mag.* [52, 261]

(1916)]. I had previously taken one example on the well-known sleeper fence adjoining the railway at Deal Station.

On the occasion now recorded I took on a post three specimens, one of which was an extraordinarily dwarf one, but perfect. As I knew that my friend Mr. Donisthorpe was anxious to add this species to his fine collection, I wrote to him and suggested that he should come down and join me in another hunt for it, which he gladly did. The day was brilliantly fine and hot, and *Hylotrupes* turned out to be very much in evidence, my friend capturing enough to make a full and fine series for his cabinet, including one truly magnificent and very large example from another old post. This I visited by myself on another day, when I observed the head and antennæ of a dead Longicorn protruding from a crack—which I carefully extracted whole. Looking on the other side of the post, I observed another alive and sitting in the sun. I soon boxed him, and both these beetles turned out to be *Criocephalus polonicus*, Mots. (= *ferus*, Kr.)

Thus it appears that the two species (*Hylotrupes* and *Criocephalus*) inhabit the same post. I believe that this is the first record of the capture of the latter species near Weybridge.

It may be interesting also to record the fact that *Cicindela sylvatica*, L., occurred again on Weybridge Heath last summer after many years' absence.—R. S. MITFORD, 4, Lisburne Crescent, Torquay.

[Fowler gives the length of *Hylotrupes bajulus* as 14-20 mm. Mr. Mitford's dwarf specimen only measures 8.5 mm., whereas my very large ♀ measures 24 mm. !—H.J.D.]

COLLECTING IN FRANCE AND ITALY.—[*Satyrus arethusa* should be *S. statilius* in every case.—E.B.A.].

August 18th.—On this afternoon I proceeded to the locality where I first took *Satyrus statilius*, and though a very strong, gusty sirocco was blowing, I put up and took thirteen fine imagines of this butterfly, including several females which were fully out. I could have taken more as the species seemed strongly established in this particular place, but as I was recovering from an attack of "Spanish flue," even perfect *S. statilius* failed to make one stand upright when one's legs were weak. I also took a large female *Pontia daplidice* and the smallest example I have ever seen of *Melitaea didyma*.

August 21st.—In the garden I saw but failed to secure a fine example of *Ruralis betulae*, although it settled within easy reach. Imagines of *Catocala nupta* were still quite fresh, and now and then came into the villa. The abundant *C. electa* were now going over and required careful selection for cabinet specimens. In the afternoon I again visited the steep hillside just behind the last villa, and there in a small clearing at the foot I obtained *Limenitis camilla*, *Satyrus circe*, *Agriades coridon* females, *Urbicula comma* both sexes, females of *Polyommatus icarus*, and of *Brenthis dia*, *Pieris rapae*, and on the rougher ground higher up a female of *Colias hyale*. The day was a very hot one.

August 22nd.—This afternoon I re-visited the first gorge to the right across the River Scrivia. *B. dia* was still fresh and abundant all the way up. At the back of Vocemola cemetery I took *Callimorpha hera*, and further up I saw but failed to reach a very good specimen of *Euranessa antiopa*. Still further up and to the right of the stream,

where large masses of *Eupatorium cannabinum* grow, large numbers of Lycaenids were settling, together with *Limenitis camilla*, *B. dia*, *Coenonympha pamphilus*, *Urbicula comma*, and *E. iurtina*. Returning towards the cemetery I took the narrow pathway along by the vineyards leading into the broad way mentioned on August 15th. Passing through the little copse towards the river I at length reached the ground where *S. statilinus* abounds. Both sexes were still in numbers. I returned along the river bed, and a search in the villa garden gave no further sign of *Ruralis betulae*.

August 26th.—This afternoon I crossed the railway in front of the villa, and turning left, skirting the edge of the cliff, reached the "Bluff." Descending the steep slope I worked the wooded portion at the bottom, where not only the stream but also the backwater from the river, the abode of dragonflies in June, was quite dried up. The Sirocco was very gusty, but in comparatively sheltered spots I was able to take *S. statilinus*, *P. daplidice*, *Colias hyale*, *C. edusa*, *Pieris rapae*, *Polygonia e-album*, *U. comma*, *Agriades coridon*, *A. thetis*, and an *Aricia medon* (astrarche). *C. edusa*, *C. hyale*, and *P. daplidice* appear to have been fresh emergences, and I saw *Pyrameis cardui* and *P. atalanta*, both quite fresh. This morning, at 6 a.m., my servant knocked at my door to inform me that there was a grass snake on the landing outside my door. I dressed hastily and soon joined in the hunt, and after a little patience succeeded in getting our visitor into a bottle. It was about 16 inches long and rather prettily striped with black on a dark brown skin. How it crawled up the staircase I do not know; it seemed very muscular.

August 28th.—Moths came very freely to the electric lights last night, much more so than before during the whole month. Among my captures were *Lastocampa quercus*, *Acontia luctuosa*, *Agrophila trabealis*, *Rumia luteolata* (crataegata), *Timandra amata*, *Xanthorhoe tristata*, *Gnophos dilucidaria*, etc. A female of *Lymantria dispar* emerged this morning. In the afternoon I went to the "Bluff" locality again and got the same species as before with males of *C. edusa*, which were settling freely in the dry bed of the stream, *C. pamphilus*, quite fresh, one *Cupido sebrus*, the only fresh example of *Vanessa io* I have so far seen this year, and a very dark form of *Rumicia phlaeas*. *S. statilinus* was still on the wing although somewhat the worse for wear.

August 29th.—This afternoon we had a heavy thunderstorm with frequent lightning and a deluge of rain, the only real rain since June 25th, when we had a similar storm, though in early August there was a slight passing shower for a few minutes.

August 30th.—Last night after the storm the following moths came to light, *Amathes helvola* (rufina), *Thamnonoma vauaria*, *Euchloris smaragdaria*, and *Numeria pulveraria*, but what promised to be a good night was frustrated by a lightning storm, which completely stopped the flight. At the bottom of the "Bluff," at Arquata, this afternoon, in addition to my former captures I took *Pararge megera*, *Plebeius aegon*, *Everes argiades*, and one fine specimen of *Erynnis alceae*. The females of *S. statilinus* were now very abundant, the males very worn. The weather was much cooler, and Monte Rosa appeared very clear, apparently fresh covered with snow by the storm.

August 31st.—I ascended the steep hillside by the zigzag path at

the back of the villas at Arquata. The only fresh records were two dragonflies, females of *Sympetrum scoticum* and *Ischnura pumilio*, on the hill top. *S. statilinus* were easily taken as they settled, and *S. circe* was even now in fair condition. The leaves were now beginning to fall fast, the first sign of autumn, although the heat of the sun at midday was still fierce.

September 2nd.—Last night there was another heavy thunder-storm, just before which two specimens of the large Orthopteron, *Thaneroptera falcata*, jumped into my bed-room, no doubt attracted by the electric light, and took shelter together with a female *S. statilinus* and the following moths: *Cilix glaucata*, *Rumia luteolata*, *Bryophila perla* and *Tephrosia crepuscularia*.

September 4th.—Yesterday afternoon the garden yielded the dragonfly *Sympetrum striolatum*, male, and the Hymenopteron, *Polistes gallica*, and at night *Cilix glaucata*, a common species here, again came to light, with a female *Lasiocampa quercus*, which on being boxed immediately commenced to oviposit, *Triphaena comes*, another abundant species, and *Thyatira batis*, the first I have seen here. On the floor I boxed a male *Gryllus campestris*. In the garden I took *Anaitis plagiata* newly out, and a fresh example of *S. stellatarum*, which is an abundant species throughout the fine season.

September 5th.—Last night at light I added *Plusia chrysitis* (2nd brood) in company with the beetle *Balininus glandium*. In the afternoon of a somewhat windy day, on the hillside away from Arquata, I met with freshly emerged *P. rapae*, males of *S. statilinus*, and both sexes of *A. coridon*. Males of both *C. edusa* and *C. hyale* were about, but it was too gusty to get them.

September 7th.—On this gusty, thundery afternoon with no sun I went to the foot of the "Bluff" and found freshly emerged *S. stellatarum* at the blossoms of *Centaurea calcitrapa*. I took a female *G. rhanni*, the first I had seen since early July with a sprinkling of *A. thetis* (bellargus), *P. rapae*, *P. napi*, *P. daplidice*, and females of *A. coridon*. *P. megera* and *P. daplidice* were in perfectly good condition and even numerous here.

September 11th.—Last evening the moths *Triphaena comes* (orbona), *Ortholitha plumbaria*, the autumn "may fly," and the Orthopteron *Pheneroptera falcata* came to light. This afternoon, crossing the railway I turned to the left and went again to the bottom of the "Bluff," meeting with the same species as before. Making my way along the dry bed of the stream when I reached the small stagnant pools, the only remnants since June of the flowing stream, I secured males of the Dragon-flies *Lestes sponsa*, one male of *Orthetrum caerulescens*, and a pair of *Platynemis pennipes*, in cop. I then crossed the dry wide bed of the Scrivia, where masses of yellow hawkweed were in full flower. Here I took *Hesperia malvae*, [?] and both sexes of *C. hyale* and *P. daplidice* were feeding in numbers on the blossoms. Just above the river bank *C. edusa* was flying rapidly with fresh *Pieris rapae* and *A. thetis*. Instead of crossing by the wooden bridge I took the stony bed of the river and secured the Orthoptera *Oedipoda caerulescens* and *Stethophyma fuscum* on the way.

September 14th.—A perfect day, strong sun and no wind, the first windless day for many weeks. Again I descended through the wood near the "Bluff" to the bed of the stream. Here the products of the

seeds of May, June and July, many thousands of several varieties of hawkweed, willow-herb, etc., had sprung up and were in full flower. Females of *P. rapae*, *P. daptidice* and *C. edusa* were swarming at the flowers accompanied by a few *C. hyale*, *P. cardui*, *P. megera*, and the late emergence of *Anthocharis belia*, the last a very difficult species to capture in the wind. All were in capital condition but *A. belia* which wanted careful selection. I had a fine form of *Mantis religiosa* brought me to-day, the only bright green summer form I have so far seen, although, I understand, quite plentiful in the district. I also secured after repeated attempts a very large specimen of the Orthopteron, *Stethophyma fuscum*.

September 16th.—I collected this afternoon in the bed of the river between the Bluff and the wooden bridge. This was another cloudless day with hot sun and no wind, and Lepidoptera were swarming at the blossoms of the hawkweeds and other plants in flower. In addition to my captures of September 14th. here, I took a female *Issoria lathonia* in excellent order, and fresh specimens of *Rumicia phlaeas* and *Colias edusa*, with some newly emerged very large spotted female *Pieris brassicae*. Along the rocky sides of the left bank, just below the *Catocala* ground of July-August, I found a perfect specimen of the beautiful *Deiopeia pulchella*, the first living example I had met with. A little further on I secured a perfect specimen of *Mantis religiosa*, the green summer form on a hawkweed flower-head. The Orthoptera are very abundant in the dry rocky bed of the Scrivia, rising in twos and threes, every few yards as one walks along it.—LIEUT. E. B. ASHBY (F.E.S.). Hounslow. (*To be concluded.*)

LATE APPEARANCE OF AGRIADES CORIDON.—On Oct. 6th I took a pair of *A. coridon*, the Chalk Hill Blue in *cōp.* Is not this an extremely late date?—S. A. CHARTRES, 4, King's Drive, Eastbourne.

POLYGONIA C-ALBUM NEAR SALISBURY.—At the end of September and early in October three specimens of *Polygonia c-album* were caught by a son of Dr. G. Kempe, of this city, in a garden in Warminster. Is this not a rather unusual locality for this butterfly? A *Gonepteryx rhamni* was seen flying in Wilton only three days ago although the weather is so cold.—H. G. GREGORY, Westleigh, Salisbury, Nov. 29th.

CURRENT NOTES AND SHORT NOTICES.

When one acquires an addition to one's library a closer examination of the author's work often reveals certain personal characteristics and peculiarities which a casual reference does not show. Recently this was the case with the "Catalogue of North American Butterflies," by Herman Strecker, 1878. Among other features of the work is an "Alphabetical and Explanatory List of Localities," to which there are some notes, *e.g.*, Mexico, "The principal pastime of the inhabitants is to cut each other's throats. They have frequent changes of the administration, sometimes being blessed with several in one day. The Emperor Maximilian endeavoured to establish order and suppress anarchy, but through the interference of the United States, which wanted Mexico for itself, his efforts were rendered abortive, and he shared the fate of other reformers, being ruthlessly murdered by the miserable

ruffians who now enact the farce of governing that unhappy country. . . . The fauna of Mexico is beautiful, especially towards the south, but it is worth a man's life to travel through it, as each inhabitant considers him- or her- self a self-constituted committee of one to murder and rob whoever Providence sends in their way." And again, Morman Land. "Utah, the land of the Salt Sea and Latter-day Saints, where polygamy is allowed by law, and though it is one of the territories of the United States of North America, that great government has been unable to enforce the federal laws against a plurality of wives, for when the United States troops were sent to enforce those laws, the army of saints vanquished them—yea hip and thigh—and Uncle Samuel could but weep in silence and let his degenerate children in Utah go to perdition the quickest way possible, *i.e.*, in the arms of as many wives as they could feed or starve." Of New Zealand he says, "One of the principal articles of export is the embalmed head of the natives, . . . the demand for the article among civilized collectors became so large that a domestic market was established by tatooing the faces of slaves and subjects, then slaughtering and passing their heads off on the unsuspecting customer as those of genuine chiefs. This is, or was, also where those missionaries who were emulous to obtain the crown of martyrdom went for that delectable purpose, when the obliging natives speedily fulfilled their pious wishes by butchering and afterwards feasting on them."

The *Bull. Soc. Léop. de Genève*, although published in May last, has only recently come to hand. As usual it contains an excellent coloured plate of aberrations of European Lepidoptera by M. Culot, and another plate showing the genitalic characteristics of further species of the genus *Hesperia*. The papers included are—two by M. Reverdin, "A Note on *Hesperia syrichtus*, Fab.,"; and a Note on "*Melitaea aurinia* ab. *epinolpadia*,"; one by C. Lacreuzé, "Description of the less known Lepidoptera found in the neighbourhood of the Lake of Geneva,"; one by F. Brocher, "The pulsatory mesotergal organ in Lepidoptera,"; and one by A. Pictet, "Researches concerning the ontogeny of *Notodonta ziczac* during three generations in the same year." There are also some twenty pages of proceedings at the meetings of the Society during 1918.

In the *Rev. Mens. Namur.* for September, M. Derenne points out that the ab. *variegata* of *O. pyramidea* figured in Seitz *Macro-lep. of the World*, III. Pal. Noct. (1911), is the same as ab. *pallida*, Lamb, *Rev. Mens.*, 1908. Hence by the rule of priority the name *variegata* falls. The List of the "Papillons de la Région de Namur" is continued.

The *Scot. Nat.* contains a further article on Aphides by Dorothy J. Jackson, F.E.S., "Aphides collected in the Scottish Highlands." Several additions to the Scottish Fauna in Coleoptera are chronicled by A. Fergusson, F.E.S.

The *Ent. News* for October contains a long and useful article on the "Preparation of Hemiptera for the Cabinet," by H. M. Parschley, in which he states clearly that, "The science of entomology has reached its present state of advancement very largely through the unpaid effort, the labour of love, of enthusiasts, and we may hardly look for any progress that is worth while, in the technique of mounting specimens or in matters of higher import, if entomologists, pro-

fessional or otherwise, come to be actuated as a class by any spirit other than that of the true amateur." After a very detailed discussion of the technique of preparation he concludes by urging that "One of the finest aspects of our science is the opportunity for co-operation which it affords." The editor in his monthly note condemns the "most foolish form of egomania" to make it a condition of the gift of a collection that it be kept intact, making it "a source of trouble" and "practically neglected."

The *Bull. Soc. ent. Belgique* contains a long account of the "Habits of the Sand-wasp *Ammophila*," by M. Descy, and the *Annales Soc. ent. Belgique* "Notes on the Ptychoptoridæ (Dipt.)," by M. A. Tonnoir, dealing particularly with the secondary sexual organs of the males of certain species.

The *Rev. Mens. Namur.* for October adds a whole batch of names to our lists of aberrations of Lepidoptera. *Argynnis selene* ab. *interligata*, in which the two black spots in the median portion of the inner margin of the forewing are united by a black bar; *A. lathonia* ab. *interligata*, with a similar aberration; *Brenthis ino* ab. *chlorographa*, in which the spaces between 1 and 2 in the median area of the forewings are of a whitish-yellow; *Gonepteryx rhamni* ab. *variegata*, in which all four wings have on the upperside more or less regular orange spots; *G. rhamni* ab. *rhamnoides*, a very small specimen, one-third smaller; captured; *Euchloë cardamines* ab. *proosti*, ♀ in which the disc of the forewings above have somewhat orange-yellow markings, and the apical black blotch contains, in addition to the three or four white spots, four white dots, two of which are tinged with orange-yellow. The disc of the hindwings is wholly tinged with the orange-yellow; and *Apatura iris* ab. *viridana*, in which the upperside of the wings has a wide marginal border of a brilliant greenish tinge. The last is described by M. Ch. Cabeau, the rest by M. Derenne; we hope that no synonyms have been created. In the same number is an article on the form of Pierid aberration in which a black point appears on the disc of the hindwings—*Pieris napi* ab. *posteromaculata*, *P. rapae* ab. *nigropunctata*, and *P. brassicae* ab. *posteromaculata*.

In the *Ent.* for October H. Rowland-Brown discusses the history, variation, and distribution of *Zygaena achilleae*. Messrs. Newstead and S. G. Smith describe several new aberrations of British Lepidoptera, *Boarmia biundularia* ab. *venosa* in which the ground colour is almost pure white on the forewings, the hindwings being sooty-brown; *Biston strataria* ab. *ochrearia*, in which the ground colour of all the wings is yellowish-buff; *Crocallis elinguaris* ab. *signatipennis*, in which the ground colour is decidedly dark buff and the transverse band narrowed to a point on the inner margin; and *Nyssia zonaria* ab. *ochracea*, in which the ground colour is a pale yellowish-buff.

Mr. Franz Derenne has sent us a copy of his *Liste des Papillons de la Région Namuroise*. It will carry us a decade and a half further in the records of forms found in the Namur area than did the work of M. Lambillion, to whom the present brochure is dedicated.

How very kind the *Naturalist* of November is! It actually wishes to settle all our business for us. It suggests that even the editors of various magazines should be pooled. "We don't think."

The *Can. Ent.* for October contains an account of a Collecting Tour in Antigua by Mr. and Mrs. Stoner.

The large Ichneumon *Rhyssa persuasoria*, according to the *Irish Nat.*, October, is by no means uncommon in Counties Down and Fermanagh. Some interesting notes of its method of attack are given by the Rev. W. F. Johnson.

In the *Bull. Soc. ent. Fr.* for October, M. A. Honoré gives an annotated list of the species of Hymenoptera which are found in the neighbourhood of Paris. M. L. Demaison records the capture of *Melitaea didyma* in the forest S. of Rheims, probably quite its north-westerly limit.

We are informed that Vol. IV. of Seitz *Macrolepidoptera of the World* (Palearctic *Geometridae*) has been completed, and that the English and French Editions can be obtained of the Publishers. It will be remembered that Messrs. Williams and Norgate were the agents for this work in Great Britain. To those who have not completed Vol. III. (Palearctic *Noctuidae*) we note that the concluding part or parts were issued late in the year 1914.

There is to be a Verrall Supper this new year.

We regret to hear that Lord Walsingham died a few days ago. A memoir will appear later.

CONTENTS OF VOLUME XXXI.

By H. J. TURNER, F.E.S.

	PAGE		PAGE
Aberrations of <i>A. aescularia</i> , 18;		<i>trapezina</i> , 52; Lepidoptera in	
<i>P. brassicae</i> , 18; <i>P. rapae</i> , 18;		Ireland, 53; <i>A. urticae</i> larvae,	
<i>P. atalanta</i> , 18; <i>C. inquisitor</i> ,		53; <i>A. archippus</i>	57
19; <i>H. malvae</i> , 19; <i>A. thetis</i> ,		<i>Acalla reticulata</i> , Ström = <i>contami-</i>	
19; <i>L. arion</i> , 19; <i>A. atomaria</i> ,		<i>nana</i> , Hb.	158
19; <i>E. sanguinolenta</i> , 20; <i>D.</i>		<i>Aculeate Hymenoptera</i> from Leices-	
<i>vinula</i> , 20; <i>C. trapezina</i> , 52;		tershire in 1918	15
<i>A. urticae</i> , 54; <i>X. fluctuata</i> , 55;		<i>Alpine B. pales</i>	148
<i>B. repandata</i> , 55; <i>A. caia</i> , 55,		<i>Annuae Butterflies</i>	142
58, 78; <i>N. tages</i> , 58; <i>A. coridon</i> ,		<i>Annual Exhibition of the S. London</i>	
58; <i>P. megera</i> , 58; <i>D. paphia</i> ,		<i>Society</i>	76
60, 77, 78, 99; <i>E. cardamines</i> ,		<i>Ants in collection of Rev. O.</i>	
72; <i>B. selene</i> , 76; <i>S. ericetaria</i> ,		Pickard-Cambridge, 1; with the	
74; <i>R. betularia</i> , 77; <i>C. dispar</i> ,		<i>lady-bird C. distincta</i>	217
78, 97; <i>Starling</i> , 78; <i>Pied</i>		<i>Arctic B. pales</i>	151
<i>Wagtail</i> , 78; <i>S. pavonia</i> , 78;		<i>Asymmetry of A. ichneumoniformis</i>	140
<i>A. villica</i> , 78; <i>T. evanthé</i> ,		<i>Association of M. ochraceella</i> with	
79; <i>R. phlaeas</i> , 97, 135; <i>M.</i>		<i>ants</i> , 24; <i>C. distincta</i> and <i>ants</i>	
<i>polymnia</i> , 117; <i>P. aegon</i> , 118;			58, 217
<i>A. medon</i> , 118; <i>P. icarus</i> , 118;		<i>A. thetis</i> race <i>vectae</i>	90
<i>Argynnidae</i> , 118; <i>S. clathrata</i> ,		<i>Bigenerate species of butterflies</i>	107, 143
118; <i>P. napi</i> , 135; <i>H. jacobaeae</i> ,		<i>Biological note on T. bistortata</i> ,	
135; <i>L. hirtaria</i> , 137; <i>C. edusa</i> ,		138; <i>C. vibicella</i>	169
176, 212; <i>M. cinxia</i> , 176; <i>P.</i>		<i>Breeding of, H. crinanensis</i> , 12;	
<i>aegeria</i> var. <i>egerides</i> , 176, 192;		<i>L. alcon</i> , 116; <i>A. nebulosa</i> , 120;	
<i>B. euphrosyne</i> , 192; <i>C. 11-punc-</i>		<i>C. distincta</i>	220
<i>tata</i> , 213; <i>C. distincta</i>	215	<i>Brenthis pales</i> , its History and its	
<i>Aberrant larva produces aberrant</i>		<i>named forms</i>	148
<i>imago of C. glabraria</i>	192	<i>Broods of, Successive, D. truncata</i> ,	
<i>Abnormal antenna of S. atrata</i> ..	185	58; <i>Tuscan Rhopalocera</i> , 66;	
<i>Abraxas grossulariata</i> ab. <i>exquisita</i> ,		<i>Continuous</i> , 70; <i>Graduated</i> , 71,	
84, 205; <i>Second brood</i>	76	104; <i>D. mendica</i> , 101; <i>Sup-</i>	
<i>Abundance of D. paphia</i> , 34; <i>C.</i>		<i>pressed</i>	108

	PAGE		PAGE
Carrying habit of paired Lepidoptera	75	Exhibition, Annual, S. Lond. Ent.	
Cases of <i>C. nigricella</i>	120	S.	76
Catalogue of Palaearctic <i>Psychides</i>	165	Field Notes, from Bath, 14; Some,	
Causes, of error in estimating		for 1916-17	92
number of broods, 67; Suggested,		Food-plant of <i>H. crinanensis</i>	12, 33
of ill development	78	Forcing of <i>C. pendularia</i>	137
Chalcid bred from an undigested		Genitalia, in <i>Hesperia</i>	81
seed	117	Genus <i>Hesperia</i> , The	81
Collecting in various places in		Geographical variation, Table of,	
1916-18, 5, 61, 156; Hints-on,		in <i>C. pamphilus</i> , 122; <i>M.</i>	
in the Holy Land, 64; in Egypt	140	<i>didyma</i> , 182; <i>M. phoebe</i>	183
Comparison of British and Canadian		Gynandromorphous <i>C. myrmeco-</i>	
Hymenoptera	190	<i>philus</i> , 25; <i>C. angulifera</i> , 38;	
Corrections and Emendations, 43,		<i>D. paphia</i> , 77, 78; <i>C. argiolus</i> ,	
121, 130, 157,	223	77; <i>P. icarus</i>	138
Crossing of <i>D. mendica</i> and v.		Habits of <i>H. semele</i> , 94; <i>G. obscu-</i>	
<i>rustica</i>	101	<i>rata</i> , 94; <i>P. aterrima</i> and <i>H.</i>	
Current Notes, etc. 17, 35, 57, 76,		<i>testudinea</i> , 139; <i>L. populi</i>	190
95, 113, 135, 173, 188, 210,	226	<i>Hamearis lucina</i> at Constantinople	111
Defoliation by <i>T. viridana</i> and <i>H.</i>		<i>Hesperia</i> , The genus	81
<i>defoliaria</i>	75, 111	<i>Hylotrupes bajulus</i> near Weybridge	222
Delayed emergence of <i>R. jorulla</i> ,		<i>Hyponephele lycaon</i> and <i>H. lupinus</i>	
37; <i>C. pendularia</i>	211	two species	205
Description of, ergatandromorph of		Inheritance of Colour in <i>Diaphora</i>	
<i>M. sulcinodis</i> , 1; <i>A. aletris</i> , 10;		<i>mendica</i>	101, 148
<i>M. coregyrella</i> , 11; <i>M. ertella</i> ,		Is <i>Arctia caja</i> habitually a day-	
11; <i>M. uxor</i> , 11; <i>A. grossu-</i>		flier?	111
<i>lariata</i> ab. <i>variegata-lutea</i> , 34; <i>C.</i>		Larva of <i>O. vetusta</i> , 42; <i>H. crina-</i>	
<i>polypyga</i> , 26; larva of <i>O. vetus-</i>		<i>ensis</i> , 177; <i>A. leucostigma</i>	177
<i>ta</i> , 42; Rhodesian <i>Staphylinidae</i> ,		Late appearance of <i>H. defoliaria</i> ,	
83; varieties of <i>A. iris</i> , 114;		111; <i>A. coridon</i> , 226; <i>P. c-album</i> ,	
<i>C. pendularia</i> ab. <i>orbiculoides</i> ,		226; <i>G. rhamnii</i>	226
136; forms of <i>B. pales</i> , 154;		Lepidoptera of an Essex Wood	49
larva of <i>H. crinanensis</i> , 177;		Life-history of <i>C. wailseilla</i>	203
larva of <i>A. leucostigma</i> , 178;		<i>Ligea</i> versus <i>euryale</i>	97
<i>A. grossulariata</i> ab. <i>pulchra</i> ,		Light, Appearances at	36
205; <i>C. distincta</i>		Local races of <i>E. atomaria</i>	19
Discussion on <i>A. marginipunctata</i>	138	Melanic <i>A. aescularia</i> , 18; <i>S.</i>	
Distinctions between <i>M. beckeri</i> and		<i>pavonia</i> , 36; <i>S. ericetaria</i> , 74;	
<i>M. infusum</i> , 9; <i>T. bistortata</i> and		<i>S. fagaria</i> (belgiana), 79; <i>A.</i>	
<i>T. crepuscularia</i> , 80; <i>G. epaphia</i>		<i>caia</i> , 91; <i>H. leucophaea</i> , 137;	
and <i>P. sabina</i> , 118; larvæ of <i>H.</i>		<i>H. defoliaria</i> , 138; <i>T. instabilis</i> ,	
<i>crinanensis</i> and <i>A. leucostigma</i> ..	177	138; <i>H. progemmaria</i> , 138; <i>P.</i>	
Distribution of, <i>G. leplastriana</i> ,		<i>pedaria</i>	140
36; <i>C. distincta</i>	216	Mimicry in <i>Emploea depicta</i>	20
Destructive Beetle, A	176	Mosquitoes, S.E.U. slides	98
Dragon-fly Season of 1918, The ..	91	Myrmecophilous Notes for 1918, 1,	
Druce Collection of Lycaenidae ..	185	21; Lady-bird, <i>Coccinella dis-</i>	
Dwarf, <i>A. coridon</i> a Surrey race, 80,		<i>tincta</i> , Fald.	214
89, 99, 120		Nest-building of <i>Odynerus</i>	140
Early, An, Record of <i>P. pedaria</i> ,		New, A, British Capsid, 9; Species	
34, 119; <i>H. defoliaria</i> , 99; <i>A.</i>		of <i>Aristotelia</i> and <i>Micropteryx</i> ,	
<i>cyanea</i>	139	10; <i>A. catagramma</i> , 26; Species	
Economic Entomology, 20, 57, 96,		of <i>Staphylinidae</i>	83
174, 176		Notes from Bath, 14; A few more,	
Editorial	40	from Sherwood Forest, 33;	
Emergence, A remarkable, 19; of		Bexley	91, 95
sexes of <i>O. vetusta</i> , 41; of <i>P.</i>		Notes on <i>Coccinellidae</i> , 213; Col-	
<i>aegeria</i> in Ireland, 54; Migrating,		lecting, 14, 33, 48, 75, 91, 110,	
106; Nomenclature of, 141; The		129, 168, 184, 206; British	
various modes of, of the Tuscan		Ectobias, 8; <i>O. vetusta</i> , 41;	
Rhopalocera	66, 104, 141	Lepidoptera in 1918, 56; Random,	
Ergatandromorph of <i>M. sulcinodis</i> ,		from N.E. Ireland, 53; The	
1, 116		Season 1918 in Tyrone, 72;	

- | | PAGE | | PAGE |
|--|---------------|---|---------------------------|
| Entomology in France and Italy in 1918, 111, 130; <i>Cemistoma walesella</i> , etc. | 201 | <i>nerii</i> , 188, 207; <i>Sirex gigas</i> , 206; <i>O. mollis</i> , 212; <i>G. minuta</i> , 212; <i>C. edusa</i> v. <i>helicina</i> | 212 |
| Nymotypical, The Term | 168 | Resemblance, A curious | 19 |
| Obituary of:—H. C. Dollman, 39; Lieut. J. Bateson, 59; J. Oven- den, 98; F. du Cane Godman, 99, 173; F. H. Wolley Dod, 174; Sydney Webb | 100 | Resting habits of male <i>P. aversata</i> | 19 |
| Officers and Council of, Ent. Socy. of Lond., 37; S. Lond. Ent. Soc., 38; Lanc. and Ches. Ent. Soc. | 120 | Retirement of T. W. Hall | 38 |
| Original descriptions | 159, 160, 163 | Reviews and Notices of Books, 35, 57, 76, 79, 95, 113, 134, 173, 189, 210 | 210 |
| Paired Butterflies in flight. | 75 | Saint Mark's Fly (<i>B. marci</i>) | 206 |
| <i>Papilio machaon</i> in Surrey | 131 | Scientific Notes and Observations | 12, 33, 90, 168, 204 |
| Parallel variation in <i>S. briseis</i> and <i>S. priouri</i> | 77 | Season of 1915 | 72, 91, 99, 112, 138, 212 |
| Parasites | 130 | Seasonal Polymorphism and Races of <i>Rhopalocera</i> | 26, 43, 87, 121, 179, 193 |
| Pattern and Venation | 139 | Seasonal form of <i>P. marcellus</i> | 18 |
| "Pause," The Summer, 68; The Winter | 68 | Second Brood of, <i>A. basilinea</i> , 52; <i>A. grossulariata</i> , 76; <i>N. ziczac</i> | 77 |
| <i>Plexippus</i> and <i>archippus</i> | 77 | Societies' Reports, South Lond. Ent. Soc., 18, 58, 76, 99, 118, 137, 176, 191, 211; Lancashire and Cheshire Soc., 59, 120, 140; Ent. Soc. Lond. | 115 |
| Protective coloration in larvæ of <i>A. betularia</i> | 20 | <i>Sphinx pinastri</i> in Sussex | 168 |
| Pseudogynes of <i>F. sanguinea</i> | 24 | Stainton's "Hilly Field," A Wander through | 31 |
| Races of <i>E. jurtina</i> , 54, 74; <i>H. glaucippe</i> , 79; Small, <i>C. dispar</i> , 97; Large, <i>R. phlaeas</i> , 97; <i>Charaxes</i> , 118; <i>P. octavia</i> , 118; Western, of <i>M. galathea</i> | 125 | Steppe insects | 61 |
| Random Notes from N. E. Ireland | 53 | Swarming of <i>A. archippus</i> | 57 |
| Rarity of <i>A. paradoxus</i> | 25 | Teratological, <i>E. cardamines</i> , 72; <i>H. syringaria</i> | 78 |
| Rare captures, <i>A. plexippus</i> (<i>archippus</i> ?) 37; <i>M. acuminata</i> , 37; <i>P. apollo</i> <i>race pumilus</i> , 77; <i>M. ichneumonidae</i> , 79; <i>T. evanthe</i> , 79; <i>C. polyodon</i> , 110; <i>K. quercus</i> , 116; <i>E. helveticata</i> , 116; <i>A. ocellata</i> v. <i>hebraea</i> , 119; <i>A. albipalpella</i> , 120; <i>P. nubilalis</i> , 134; <i>P. chloridice</i> , 137; Books, 137, 138, 139; <i>R. persuasoria</i> , 139; <i>M. undata</i> , 176; <i>Z. flavicollis</i> , 185; <i>B. populi</i> , 185; <i>D. nerii</i> , 188, 207; <i>Sirex gigas</i> , 206; <i>O. mollis</i> , 212; <i>G. minuta</i> , 212; <i>C. edusa</i> v. <i>helicina</i> | 212 | Treacle in December, 48; A recipe for, 50; in 1918 | 51 |
| LOCALITIES:—Akaba, 64; Arquata, 112, 130, 170, 178, 186, 209; Atherstone, 15; Bass Rock, 36; Bath, 14; Belfast, 53; Bexley, 91; Bloxworth, 1; Boulogne, 111; Bournemouth, 93; Bransford Bridge, 15; Bray, 135; Bude, 65; Burgess Hill, 202; Cartmel, Cheshire, 60; Caucasus, 17; Cheshire, 140; Chiswick, 56; Constantinople, 157; Cordoba, 212; Ditchling, 202; Dorset, 129, 207; Dulwich, 92; Egypt, 5, 140; Essex, 49; Florida, 20; France, 111; Great Glen, 15; Hayling Island, 57; Hebrides, 114; Horley, 130; Ireland, N.E., 53; Ireland, N.W., 95; Italy, 26, 43, 87, 111, 119, 121, 170, 178, 186, 209, 223; Jerusalem, 64; King's Lynn, 113; Kurdistan, 17; Lustleigh, S. Devon, 23; Leicester- shire, 76; Lough Neagh, 72; Lulworth, 129, 207; Lyme Regis, 129; Market Bosworth, 15; Mickleham, 31; Modena, 189; Mucking, 168; New Forest, 4, 20, 93; Newhaven, 201; Norfolk, 113; N. Wales, 113; Ongar, 49; Ontario, 35; Palestine, S., 61, 137, 156; Peckleton Com., 15; Portland, 130; Reigate, 130; Rhodesia, 83; Salonica, 118; Scorrer, 65, 157; Sherwood Forest, 33; Sicily, 10; Staffordshire, N., 60; Suez, 64; Surrey, 19, 20; Sussex, 201; Swanage, 129, 207; Sweden, 184; Swithland Wd., 15; Tuscany, 26, 66, 104; Tyrone, 72; Vicenza, 130; Wallasey, 60; West Indies, 211; Weymouth, 129; Wimbeldon Com., 56; Wimborne, 129; Wyre Forest, 51; York | 52 | | |

LIST OF CONTRIBUTORS.

	PAGE		PAGE
Ashby, Lieut. C. B., F.E.S.	111	Greer, Thos...	72, 168
130, 170, 186, 209, 219,	223	Gregory, H. G.	226
Ashdown, W. J.	170	James, Russell	49, 51, 53
Anderson, Joseph	206, 207	Kaye, W. J., F.E.S.	26
Box, Lieut. L. A.	16, 76	Leman, G. S. C.	185, 213
Burr, Capt. Malcolm, D.Sc.,		Mitford, R. S.	223
F.E.S.	8, 17, 18	Newman, L. W., F.E.S.	92, 95
Butler, E. A., B.A., B.Sc., F.E.S.	9	Nicholson, C.	111, 206
Burrows, Rev. C. R. N., F.E.S.	14,	Page, Mrs. R.	96
33, 80, 89, 165, 168,	177	Porritt, G.T., F.E.S.	17
Bethune-Baker, G. T., F.L.S.,		Pearson, D. H., F.E.S.	207
F.E.S.	40, 100	Raynor, Rev. G. H., M.A.	35, 205
Chartres, S. A.	34, 188, 226	Riviere, H. G.	207
Chapman, Dr. T. A., F.R.S.	41, 81	Sharp, P. A.	168
Colthrup, C. W.	75, 76, 92	Sharp, E. P.	168
Cameron Malcolm, M.B., R.N.,		Sheldon, W. G., F.E.S.	31
F.E.S.	83	Sich, Alf., F.E.S.	15, 57, 169, 201
Cockayne, E. A., M.D., F.E.S.	101	Speyer, Hy.	130
Donisthorpe, H., F.Z.S., F.E.S.	1,	Tonge, A. E., F.E.S.	34, 110
21, 40, 185, 214,	223	Turner, Hy. J., F.E.S.	148, 158
Daws, Wm.	33, 91	Verity, Dr. Roger, M.D.	26, 43, 66,
Digby, B., F.R.G.S.	184	87, 104, 121, 141, 168, 178, 193,	204, 203
Graves, Major P. P., F.E.S.	5, 61,	Williams, Harold	56
90, 111, 156			

LIST OF ILLUSTRATIONS, &c. (Notice to Binder.)

	To face	PAGE
PL. I. <i>Hesperia</i> undersides. <i>H. malvae</i> , <i>H. malvoides</i> , <i>H. melotis</i> , <i>H. cynarae</i>	81	
PL. II. " armatures. <i>H. melotis</i> , <i>H. malvoides</i>	81	
PL. III. " " <i>H. cynarae</i> , <i>H. malvae</i>	81	
PL. IV. Dwarf Lepidoptera. <i>V. io</i> , <i>A. coridon</i> , <i>A. grossulariata</i>	89	
PL. V. Aberrations of <i>Coccinella 11-punctata</i> and <i>A. bipunctata</i>	213	

Subscriptions for Vol. XXXII. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 [This subscription includes all numbers published from January 15th to December 15th, 1920.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Ten Shillings, and must be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 Cheques and Postal Orders should be made payable to H. E. PAGE.

ADVERTISEMENTS of Books and Insects for Sale, or Books wanted will be inserted at a minimum charge of 2s. 6d. (for four lines);—Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14

Subscribers who change their addresses must report the same to Mr. H. E. PAGE "Bertrose," Gellatly Road, New Cross, London, S.E., otherwise their magazines will probably be delayed.

New Cabinets and Apparatus.—Note: Finest make only, and best material only used.

12, 20, 30 and 40 drawer Cabinets in polished deal or mahogany. Specifications and prices on application.

Standard make Store Boxes, 10×8, 5/6; 13×9, 7/-; 14×10, 8/-; 16×11, 9/-; 17½×12, 10/-; postage 6d. extra. Special price by taking 12 or more of one size.

Insect and Egg Cases, Jointed Nets, Pins (Tayler's), Zinc Collecting Boxes, Setting Boards, Killing Tins, etc., etc.

Write for complete lists of set specimens, apparatus, larvæ and pupæ.

LEONARD TATCHELL, Lepidopterist, 43, Spratt Hall Road, Waustead, E. 11.

Duplicates.—*A. immorata*, *P. affinitata*, *E. venustula* (4), *S. andrenaeformis* (7), *S. spegiformis* (3), *I. globulariae* (4), *I. statices* (10), *E. miniata* (2), and others.

Desiderata.—*M. bombyliformis*, *S. apiformis*, *S. craboniformis*, *S. formiciformis*, *S. ichneumoniformis*, *S. philanthiiformis*, *S. chrysidiformis*, *L. pygmeola*, *L. muscerda*, *L. caniola*, *E. eribrum*, and many others.—*H. B. Sly, 45, Warrford Court, London, E.C.*

Duplicates.—Varleyata and other varieties of *Grossulariata*. *Desiderata.*—Good varieties and local forms. *Spilosoma urticae*, *Advenaria*, and other ordinary species to renew old series. Good Tortrices and Tineae.—*Geo. T. Porritt, Elm Lea, Dalton, Huddersfield.*

Duplicates.—*Grossulariata* var. *lutea*, *lacticolor*, *varleyata*, *fulvapiecta*, etc. *Desiderata.*—Other extreme forms of *Grossulariata*, or good vars. of *Diurni*.—*Rev. G. H. Raynor, Hazeleigh Rectory, Maldon, Essex.*

Desiderata.—*Euchloë cardamines* from Ireland; also types of *E. cardamines* from Switzerland, Italy, S. France; var. *turritis* (S. Italy), var. *volgensis*, var. *thibetana*, and of *E. grunerii*, *F. euphonioides*, *E. damone*, and any paleartic species of the genus. *Duplicates.*—*Loweia doris* and vars., a few minor vars. of *R. phlaeas* (British), and many British lepidoptera.—*Harold B. Williams, 82, Filcey Avenue, Stoke Newington, N.*

Duplicates.—*A. coridon* vars., including semi-syngrapha, *H. Comma*. *Desiderata.*—*A. coridon* var. *Albicans* (Spanish) and var. *Hispana* (do.), and good butterfly vars., especially from Ireland.—*Douglas H. Pearson, Chilwell House, Chilwell, Notts.*

Duplicates (all Clydesdale).—*Ethiops*, *Selene*, *Icarus*, *Phlaeas*, *Hectus*, *Mundana*, *Perla*, *Fulva*, *Nictitans*, *Tritici*, *Chi*, *Boreata*, *Cambrica*, *Belgiaria*, *Immanata*, *Olivata*, *Tristata*, *Boreata*, *Mercurella*, *Angustea*, *Dubitalis*, *Ambigualis*, *Truncicolella*, *Drepitalis*, *Kuhmella*, *Fusca*, *Margaritellus*, *Hortuellus*, *Hyemana*, *Phryganella*, *Ferrugana*, *Solandrinana*, *Sponsana*, *Conwayana*, *Stramineana*, *Rivulana*, *Urticana*, *Octomaculana*, *Perlepidana*, *Vaccinana*, *Geminana*, *Herbosana*, *Myllerana*. *Desiderata.*—Numerous, especially. *A. A. Dalglish, 7, Keir Street, Glasgow.*

Duplicates.—*T. pruni* (very fair); *Moneta* (bred); *T. cratægi* (bred); *Lucipara* (bred); *Juniperata* (bred); pupæ of *Bucephala*; ova *T. cratægi*. *Desiderata.*—Very numerous, to renew and extend.—*Wm. Foddy, 39, York Street, Rugby.*

CHANGE OF ADDRESS.—*H. W. Andrews, Woodside, Victoria Road, Eltham, S.E. 9.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. 1920, Jan. 21st, Annual Meeting; Feb. 4th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—*Hon. Sec.*, Stanley Edwards, 15, St. German's Place, Blackheath, S.E. 3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society).—Hall 20, Salisbury House Finsbury Circus, E.C. The First and Third Tuesday in the month, at 7 p.m. Visitors invited. *Hon. Sec.*, J. Ross, 18, Queens Grove Road, Chingford, N.E.

All MS. and editorial matter should be sent and all proofs returned to Hx. J. TURNER, 98, Drakefell Road, New Cross, London, S.E.14

We must earnestly request our correspondents *not to send us communications* IDENTICAL with those they are sending to other magazines.

Lists of DUPLICATES and DESIDERATA should be sent direct to Mr. H. E. Page, Bertrose, Gellatly Road, New Cross, S.E. 14

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

**H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.**

Full List of Ova, Larvæ, and Pupæ, also Lepidoptera, Apparatus, Cabinets etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

G. A. Bentall, F.Z.S.,

~ NATURALIST ~

10-drawer Deal Entomological Cabinets, lift off glazed tops, £6 10s. 0d.

20-drawer ditto, also with lift off glazed top Drawers, 17×15×2", £21.

40-drawer New Entomological Cabinets, with Mahogany panel doors, £70 each.

Carton Store Boxes. 15½×10½×2½", wood sides, hinged lids, cork bottom. 3s. 9d. each.

Postal or Store Box. 7½×12" Wood sides, cork bottom, lined white. 1s. 4d.

Best Pine Store Boxes. 13×9", 7s. each; 14×10", 8s. each; 16×11", 10s. each.

Whitewood Double Store Boxes. 14×12×3", 9s. 6d.; 17×12×3", 11s.

Whitewood Travelling Setting Houses. 16×12×4½", hinged ends, 13s. 6d.

Pine Breeding Cages for low feeding larvae, 16×12×7½", 7s. 6d., better quality, 10s. 6d.

Pine Larvæ Breeding Cage, with glass door, 16×12×12", 25s. each.

Superior Oval Cork Setting Boards.

¾	¾	1	1½	1½	2	2½	3	3½	4ins.
6d.	7½d.	1s.	1s. 3d.	1s. 4d.	1s. 6d.	2s.	2s. 3d.	2s. 6d.	3s.

Cork Sheets—

19½×19½×3⅜"	11½×3½×⅝"	11½×3½×⅜"	11½×3½×¼"
2s. per sheet.	2s. doz. sheets.	3s. 6d. doz. sheets.	4s. 6d. doz. sheets.

Round Chipette Boxes, very strong—

1½×1½"	1½×1¼"	2×1½"
8d. doz.	10d. doz.	1s. 6d. doz.

Round White Metal Boxes—

1½×¾"	2×¾"	2¾×1½"	3×2"
6d. doz.	7½d. doz.	1s. 3d. doz.	1s. 9d. doz.

Glass Top Metal Boxes—

1½	2¼	2½	3	3½ ins.
3s. 4d.	4s. 4d.	5s.	7s. 9d.	8s. 9d. per doz.
3½d.	4½d.	5½d.	8d.	9d. each.

Type Collections of British Noctuae and Geometrae. 100 6s. 6d., 200 17s. 6d., 300 30s., 400 50s.

British Micro-Lepidoptera and Coleoptera at same rates.

Price Lists post free for Books, Apparatus, British, Continental, and Exotic Lepidoptera, Coleoptera, Birds' Skins and Eggs.

**DUDLEY HOUSE, SOUTHAMPTON ST. (opposite Hotel Cecil),
STRAND, W.C. 2.**

SPECIAL INDEX.

By H. J. TURNER, F.E.S.

Coleoptera arranged in order of Genera. The other orders arranged by Species, Genera, Species, etc., new to Britain are marked with an asterisk, those new to Science with two asterisks.

	PAGE		PAGE
ACARINA.		<i>*var. nigra</i> 191	
coccinea, Trachyuropoda 22		Ceuthorhynchus chrysanthemi 20	
comata, Cillibano 4		Chilochorus bipustulatus 214	
humiliferus, Uropolyaspis 4		Chrysomela distinguenda 191	
ovalis, Uropoda 4		graminis 18	
philoctena, Urodiscella 4		orichalcea 20	
Trombidiidae 175		Cicindela campestris 36, 95	
uhlmanni, Antennophorus 4		sylvaticus 223	
ARANEINA.		Claviger testaceus 24	
longulus, Acartauchenius 3		Cleonus nebulosus 20	
scurrilis, Acartauchenius 3		Clythra quadripunctata .. 20, 217, 218, 221	
COLEOPTERA.		Coccinella 23, 217, 220	
Acanthoscelides obtectus 115		distincta .. 22, 23, 58, 214, 215, 216, 217, 218, 219, 220	
Adalia bipunctata 78, 213, 214		var. domiduca 214, 215	
<i>**var. donisthorpei</i> 214		var. intertexta 215, 216	
Agrilus arcuatus 174		var. labilis 214, 215, 217	
sinuatus (<i>error lunatus</i>) .. 119, 170		magnifica = distincta 214, 215	
Amerochara bonnairei 99		11-punctata 213, 214	
Amphotis 4		<i>*var. binisquipunctata</i> 213	
marginata 24		var. cakiles 213, 214	
Anatis, ocellata 18, 119, 214		var. confluens 213	
ab. hebraea 119		var. novem-punctata 213, 214	
Anoplistes ephippium 187		var. tamaricis 213	
Anthia, sexmaculata 156		<i>*var. trinisquipunctata</i> 213	
Anthocomus terminalis 176		var. tripunctata 213	
Aphodius lividus 156		var. variegata 213	
Aromia moschata 137		sempunctata .. 23, 58, 213, 216, 218	
Atemeles paradoxus 25		sempunctata = distincta .. 214, 215, 216, 218, 219	
Athous hirtus 95		Coccinellidæ .. 22, 213, 214, 218, 219	
Attagenus pelli 176		Criocephalus polonicus (ferus) .. 223	
Balininus glandium 176, 225		Cryptocephalus 20	
nucum 176		lineola 20	
tesselatum 176		Ctesias serra 20	
Blaps kollari 156		Dendrophilus pygmaeus 24	
Buprestidae 134		Dianous 57	
Byctiscus populi 185		Dinarda märkeli 24	
Calosoma inquisitor 19		Doryphora decemlineata 20	
scyophanta 18		Dytiscidæ 189, 210	
Carabidae 175		Dytiscus 59	
Carabus clathratus 95, 211		circumcinctus 116	
Cassida nobilis 139		marginalis 20	
viridis 138		Elater lythopterus 20	
Cerambycidae 189		miniatus 20	
Cetonia affinis 187		sanguinolenta 20	
aurata 134, 137, 191, 211		<i>*Epurea distincta</i> 136	

tripudians, <i>Gnophomyia</i> ..	190
tritici, <i>Contarinia</i> ..	35

HYMENOPTERA.

aceris, <i>Phylotoma</i> ..	120
acervorum, <i>Leptothorax</i> ..	1, 2, 21
acervorum, <i>Anthophora</i> ..	139
acuminata, <i>Coelioxys</i> ..	16
æneus, <i>Elampus</i> ..	76
affinis, <i>Sphecodes</i> ..	16
agrorum, <i>Bombus</i> ..	16, 130
albicans, <i>Andrena</i> ..	16
albilabris, <i>Crabro</i> ..	15
albus, <i>Halictus</i> ..	16
alienus, <i>Acanthomyops</i> ..	2, 21
alpina (rufa var.), <i>Formica</i> ..	24
alternata, <i>Nomada</i> ..	16
<i>Ammophila</i> ..	157, 189, 228
<i>Andrena</i> ..	175
arcuatus, <i>Allantus</i> ..	97
arenaria, <i>Cerceris</i> ..	138
armata, <i>Melecta</i> ..	16
arvensis, <i>Mellinus</i> ..	138
aterrima, <i>Phymatocera</i> ..	139
attenuatum, <i>Trypoxylon</i> ..	15
auratus, <i>Elampus</i> ..	76
auropunctata, <i>Wasmannia</i> ..	2
barbara, <i>Aphaenogaster</i> ..	157
barbutellus, <i>Psithyrus</i> ..	16
berolinensis, <i>Elasmosoma</i> ..	21
bifida, <i>Nomada</i> ..	16
<i>Bombus</i> ..	37
<i>Braconidæ</i> ..	38, 114, 175
brevicornis, <i>Prosopis</i> ..	16
cærulescens, <i>Osmia</i> ..	16
cæspitum, <i>Tetramorium</i> ..	1, 3, 37
callosus, <i>Odynerus</i> ..	15
campestris, <i>Psithyrus</i> ..	16
<i>Camponotinae</i> ..	3
* <i>cantherius</i> , <i>Rhogas</i> ..	175
capitosus, <i>Crabro</i> ..	15, 138
<i>Centris</i> ..	134
<i>Centrobia</i> ..	115
centuncularis, <i>Megachile</i> ..	16
<i>Ceratina</i> ..	134
<i>Chaletididæ</i> ..	115, 130
<i>Chrysididæ</i> ..	139
chrysosceles, <i>Andrena</i> ..	16
chrysostomus, <i>Crabro</i> ..	15
cingulata, <i>Andrena</i> ..	16
circumcincta, <i>Megachile</i> ..	16
clarkella, <i>Andrena</i> ..	16
clavicerum, <i>Trypoxylon</i> ..	15
clavipes, <i>Crabro</i> ..	15
<i>Coelioxys</i> ..	134
collaris, <i>Dielis</i> ..	157
communis, <i>Prosopis</i> ..	16
crabro, <i>Vespa</i> ..	187
crabroniformis, <i>Asilus</i> ..	139
cribrarius, <i>Crabro</i> ..	15
cyanea, <i>Chrysis</i> ..	76
cyanea, <i>Syntomaspis</i> ..	138
cylindricus, <i>Halictus</i> ..	16
<i>Cynipoidea</i> ..	134
daviesana, <i>Colletes</i> ..	16

<i>derhamellus</i> , <i>Bombus</i> ..	16
dimidiatus, <i>Crabro</i> ..	15
dispar, <i>Anthophora</i> ..	130
dorsata, <i>Andrena</i> ..	16
dorylloides, <i>Vespa</i> ..	139
eglanteriae, <i>Rhodites</i> ..	59
elegans, <i>Torymus</i> ..	117
elongata, <i>Coelioxys</i> ..	16
elongatulus, <i>Crabro</i> ..	15
erraticum, <i>Tapinoma</i> ..	2, 21
europæa, <i>Mutilla</i> ..	119, 120
exaltatus, <i>Salius</i> ..	15
exsecta, <i>Formica</i> ..	22
fabriciana, <i>Nomada</i> ..	16
figulus, <i>Tropoxylon</i> ..	15
flavicornis, <i>Tenthredella</i> ..	136
flavus, <i>Acanthomyops</i> ..	2, 24
florisoma, <i>Chelostoma</i> ..	16
fuliginosus, <i>Acanthomyops</i> ..	2, 3, 4, 24
fulva, <i>Andrena</i> ..	16, 139
fulviventris, <i>Osmia</i> ..	16
funebis, <i>Bruchofagus</i> ..	174
furcata, <i>Anthophora</i> ..	16
fusca, <i>Formica</i> ..	2, 24, 25
gallica, <i>Polistes</i> ..	225
germanica, <i>Vespa</i> ..	15
gibbus, <i>Sphecodes</i> ..	16
gigas, <i>Sirex</i> ..	176, 192, 206
glebaria (fusca var.), <i>Formica</i> ..	2, 25
graminicola, <i>Myrmecina</i> ..	1, 2
* <i>grandis</i> , <i>Rhogas</i> ..	175
gwynana, <i>Andrena</i> ..	16
hortorum, <i>Bombus</i> ..	16
humilis, <i>Andrena</i> ..	16
hyalinata, <i>Prosopis</i> ..	16
<i>Ichneumonidæ</i> ..	114
<i>ichneumonidæ</i> , <i>Methoca</i> ..	79
ignita, <i>Chrysis</i> ..	76
indica, <i>Apis</i> ..	96
insignis, <i>Passoloeus</i> ..	15, 76
interruptus, <i>Crabro</i> ..	15
interruptus, <i>Leptothorax</i> ..	21
juvencus, <i>Sirex</i> ..	176
lapidarius, <i>Bombus</i> ..	16
lapponicus, <i>Bombus</i> ..	37
lævinodis, <i>Myrmica</i> ..	1, 2, 218
laricis, <i>Lygæonematus</i> ..	191
lathburiana, <i>Nomada</i> ..	16
lethifer, <i>Pemphredon</i> ..	15
leucopus, <i>Halictus</i> ..	16
leucostomus, <i>Crabro</i> ..	15
ligniperda, <i>Camponotus</i> ..	218
lignisecca, <i>Megachile</i> ..	16
longicornis, <i>Eucera</i> ..	139
lucorum (terrestris var.), <i>Bombus</i> ..	37
lugubris, <i>Pemphredon</i> ..	15
maculatus, <i>Camponotus</i> ..	157
manicatum, <i>Anthidium</i> ..	16
<i>Megachile</i> ..	134
melanocephala, <i>Myrmica</i> ..	15
<i>Melipona</i> ..	134
minutulus, <i>Pompilus</i> ..	15
mixtus, <i>Acanthomyops</i> ..	4, 5
morio, <i>Pemphredon</i> ..	15
morio, <i>Halictus</i> ..	16

	PAGE		PAGE
Mutillides	211	serotinus, Emphytus	38
Myrmecinae	2	sertifer, Pteronus	97
mystaceus, Gorytes	15	shuckardi, Pemphredon	15
nana, Andrena	16	sinuatus, Odynerus	16
niger, Acanthomyops	2, 21	smeathmanellus, Halictus	16
nigroænea, Andrena	16	Sphegides	211
nitida, Andrena	16	spinipes, Odynerus	15, 18
nitidiusculus, Halictus	16	spinulosa, Osmia	16
noctilio, Sirex	176	striata, Polyrhachis	139
Nomada	175	Stylops	96
norvegica, Vespa	15, 138	subquadratus, Sphecodes	16
ochrostoma, Nomada	16	succincta, Nomada	16
Odynerus	140	sulcinodis, Myrmica	1, 116
oraniensis, Dorylus	157	sylvarum, Bombus	16
pallipes, Psen	15	sylvestris, Vespa	15, 37
parietinus, Odynerus	16	terrestris, Bombus	16, 37, 130
parietum, Spinipes	15	testudinea, Hoplocampa	139
parvulus, Salix	15	Tetramorium	3
pauxillus, Halictus	16	Thysada	115
pectinipes, Tachytes	15	trifasciatus, Odynerus	16
*perkinsi, Allantus	97	Trigona	134
persuasoria, Rhyssa	139, 229	trimarginatus, Odynerus	15
pennsylvanicus, Camponotus	174	trimmerana (rosea var.), Andrena	16
pharaonis, Monomorium	1	tristis, Diodontus	15
picea, Formica	25, 26	truncicola, Formica	218
pictus, Odynerus	15	tuberum, Leptothorax	1, 21
pilipes, Anthophora	16	tumulorum, Halictus	16
pini, Pteronus	97	tydei, Ammophila	157
podagricus, Crabro	15	umbratus, Acanthomyops	3, 4
Pompilus	157	uniglumis, Oxybelus	15
Ponera	21	vagans, Phyllotoma	59
præcox, Andrena	16	variegata, Agenia	15
pratensis, Formica	2, 218	varius, Crabro	15
pratorum, Bombus	16	venustus, Bombus	16
punctatissimus, Halictus	16	Vespa	37
quadricolor, Psithyrus	16	vestalis, Psithyrus	16
quadridentata, Coelioxys	16	viaticus, Myrmecocystus	157
quadrimaculatus, Crabro	15	virginalis (terrestris var.), Bombus	16
quinquepunctata, Sapyga	15	vulgaris, Vespa	15, 187
Rhyncophora	38	*wesmaeli, Lygaeonematus	191
roberjeotiana, Nomada	16	*westwoodi, Stenamma	1
rosæ, Rhodites	59	wilkella, Andrena	16
rosea, Andrena	16	willughbiella, Megachile	16
rubicundus, Halictus	16	xanthomelana, Osmia	16, 139
rudii, Chrysis	76	Xylocopa	112, 113, 131, 134
rufa, Formica 2, 10, 21, 22, 23, 24,			
25, 217, 218, 219, 220			
rufa, Osmia	16		
rufa, Vespa	15		
rufescens, Coelioxys	16		
rufescens, Polyergus	218		
rufibarbis, Formica	218		
ruficornis, Nomada	16		
rufipes, Mutilla	157		
ruginodis, Myrmica	1, 2, 37		
rugino-laevinodis (laevinodis var.),			
Myrmica	2		
*rugulosus, Rhogas	175		
rupestris, Psithyrus	16		
sabuleti (scabrinodis (var.), Myr-			
mica	1, 2		
sabulosa, Ammophila	187, 188		
sanguinea, Formica	24		
scabrinodis, Myrmica	1, 2, 136		
Scoliides	211		

LEPIDOPTERA.

abdominalis (acaciæ race), Nord-	
mannia	48
abetonica (argyrognomon race),	
Plebeius	46
abetonica (ceto race), Erebia	124
abietella, Dioryctria	119
ablutella, Anerastia	156
abruptaria, Hemerophila	60
abyssinica (didyma race), Melitæa	182
acaciæ, Nordmannia	48, 142, 186
Acalla	164
acamas, Cigaritis	7
acauda (philenor ab.), Papilio	212
aceriana, Gypsonoma, Hedya	56, 201
aceris, Apatela	170
acetosæ, Nepticula	202
achilleæ, Zygaena	228

	PAGE		PAGE
Acidalia	156	alinata (ilicis <i>ab.</i>), Nordmannia ..	47
acis, Thecla	20	allionia (statilinus <i>race</i>), Hipparchia	128
acteon, Thymelicus 28, 142, 171,		allous (medon <i>race</i>), Aricia ..	45
173, 186, 187, 207		alpina (didyma <i>race</i>), Melitæa	180,
adaperta (machaoon <i>ab.</i>), Papilio ..	190	181, 182	
addenda (jurtina <i>ab.</i>), Epinephele		alpinana (politana <i>race</i>), Hemi-	
74, 212		mene	202
adelassia (cydippe <i>ab.</i>), Argynnis ..	196	alpophila (argyrognomon <i>ab.</i>),	
adippe=cydippe 77, 118, 142, 186, 187		Plebeius	46
adonis, Morpho	117	alsines, Caradrina	52
adrasta (mæra <i>race</i>), Pararge ..	127	alsus (argyrognomon <i>ab.</i>), Plebeius	46
adrastæformis (mæra <i>ab.</i>), Pararge	127	alternans (phoebe <i>race</i>), Melitæa ..	183
**adusta (revayana <i>ab.</i>), Sarro-		althææ, Erynnis	27, 147
thripus	136	alveus, Hesperia .. 81, 82, 131, 206	
adyte (ligea <i>race</i>), Erebia	97	amandus, Polyommatus 131, 132,	
ægeria, Pararge 54, 65, 72, 73, 78,		133, 134, 142, 171	
80, 96, 108, 112, 113, 127, 128,		amarah, Lycænesthes	65
146, 147, 148, 176, 192, 209		amaranthella, Coleophora	136
ægon (argus), Plebeius 45, 46, 65,		amata, Timandra	132, 224
77, 94, 109, 118, 134, 145, 157,		amenophis, Hesperia, Powellia 5,	
171, 187, 208, 209, 210, 224		ameriana = reticulata (contami-	
aello, Oeneis	108	nana)	161, 162
æscularia, Alsophila	18	americana, Hesperia	212
æstivalis (icarus <i>race</i>), Polyom-		ampla (edusa <i>ab.</i>), Colias .. 87,	121
matus	44	anargyra (paphia <i>race</i>), Dryas ..	197
æstivalis (pamphilus <i>race</i>), Cæno-		anatipennella, Coleophora ..	95
nympha	71, 121, 122	andalusica (dorus <i>race</i>), Cæno-	
æstivoides (machaoon <i>var.</i>), Papilio	88	nympha	123
æstivus (machaoon <i>race</i>), Papilio 88,	89	andereggii (cyllarus <i>race</i>), Glauco-	
ætherea (phoebe <i>race</i>), Melitæa ..	183	psyche	29
æthereæformis (phoebe <i>race</i>), Meli-		andreaia (marginata <i>ab.</i>), Lomas-	
tea	183	pilis	135
afflicta (iris <i>ab.</i>), Apatura	135	angulata (machaoon <i>ab.</i>), Papilio ..	89
afzelianus (revayana <i>ab.</i>), Sarro-		angulifera, Callosamia	38
thripus	76	angulifera (erosaria <i>ab.</i>), Ennomos	36
aglaia, Argynnis 53, 59, 65, 77, 94,		angulosa, Pericopsis	20
114, 118, 195, 196, 207		angulosa (sebrus <i>race</i>), Cupido ..	47
Agriades	110	angustana, Euxanthis	56
ajax=marcellus	18	angustefasciata (sibilla <i>ab.</i>), Limen-	
alba (urticæ <i>ab.</i>), Aglais	77	itis	179
albescens (didyma <i>race</i>), Melitæa ..	181	anteros, Celastrina	158
albescens (rhamnirace), Gonepteryx	48	anthemidana, Eupcecilia	32
albicillata, Mesoleuca	72	antiopa, Euvanesa 18, 80, 112,	
**albimaculata (revayana <i>ab.</i>),		144, 145, 187, 188, 209, 223	
Sarothripus	136	antiqua, Orgyia	41, 42, 79
albina (coridon <i>race</i>), Agriades ..	78	antonia (cleopatra <i>ab.</i>), Gonep-	
albipallata (grossulariata <i>ab.</i>),		teryx	64, 157
Abraxas	205	antonia = taurica	64, 157
albipalpella, Anacamptis	120, 140	apenninicola (ægon <i>race</i>), Plebeius	45
albolunata (coridon <i>ab.</i>), Agriades	77	apenninicola (thetis <i>race</i>), Agriades	29
albovarleyata (grossulariata <i>ab.</i>),		apenninigena (didyma <i>race</i>), Meli-	
Abraxas	34	tea	179, 181, 182
albovelata (onopordi <i>race</i>), Hesperia	27	apenninigena (goante <i>race</i>), Erebia	124
albovenosa, Arsilonche	175	apenninigena (thetis <i>race</i>), Agriades	30
alceæ, Erynnis 27, 61, 62, 64, 147,	224	apenninophila (argyrognomon <i>race</i>),	
alacetas (coretas), Everes 47, 108, 144		Plebeius	46
alchymista, Catephria	173	aphirape, Brenthis	149
alciphron, Loweia 28, 119, 134,		apicalis (galathea <i>race</i>), Melanargia	189
142, 170, 173		apicella, Coleophora	115
alcithoë (ilia <i>ab.</i>), Apatura	190	apollinus, Doritis	62, 64
alcon, Lycæna 115, 116, 136, 189		apollo, Parnassius	77, 88
aletris, Aristotelia	10, 11	appennina (mæra <i>race</i>), Pararge ..	127
alexanor, Papilio	64	appenninicola (aglaia <i>race</i>), Ar-	
alexis=cyllarus	189	gynnis	196
alfacarensis (thetis <i>race</i>), Agriades	30	aprilina, Agriopis	50, 79, 95, 140

	PAGE		PAGE
aquilonaris (pales race), Brenthis ..	151	auriflua = similis	18
aragonensis, Agriades 29, 30, 44,		aurinia, Melitæa 72, 73, 77, 95,	
77, 110, 145, 206		135, 227	
arcania, Cœnonympha 71, 72, 123,		auro-limbata, Orgyia	79
132, 133, 143, 170, 171		ausonia, Anthocharis	63, 64
arceuthata (helveticata ab.), Eupithecia	115, 116	ausonidarum (semiargus ab.), Polyo-	
archippus (plexippus), Anosia		ommatus	45
(American) .. 57, 77, 78,	211	australiformis (althæa race), Eryn-	
Arctiidae	209	nis	27
Arctus	165	australior (lavathera race), Erynnis	27
areola, Xylocampa	191	australis (alcea race), Erynnis 27,	61
arete (hyperantus ab.), Aphantopus	211	australis (glaucippe race), Hebe-	
arethusia (in error) = statilinus ..	223	moia	79
arge, Melanargia	110, 211	australis (megea race), Pararge ..	127
argentella, Elachista	202	australis (pamphilus race), Cœno-	
argiades, Everes	47, 210, 224	nympha	121, 122
argiolus, Celastrina, Lycænopsis 46,		australissima (argyrognomon race),	
65, 77, 91, 92, 95, 112, 113, 131,		Plebeius	46
135, 138, 146, 157, 158, 172, 175		autumnana (hastiana ab.), Peronea	19
argus = ægon 45, 46, 65, 109, 145,		aversata, Acidalia	19, 92
157, 171		baia, Noctua	50, 52, 74
argus = argyrognomon	46	baiuvarica (cydippe ab.), Argynnis	196
Argynnidia	196	balcanica (pales race), Brenthis ..	154
argyrognomon (argus), Plebeius ..	46	balcanicus, Tarucus	61, 62
argyrognomon (idas), Plebeius 46,		ballus, Thestor	6, 112
68, 145		banghaasi (pales race), Brenthis ..	154
arion, Lycæna 19, 20, 65, 117, 142,		baralacha (pales race), Brenthis	
173, 186, 187, 188, 210		151, 155	
Aristotelia	10	basilinea, Apamea	52
armeniaca (grunerii race), Euchloë,		bassettella, Euclemensia	114
Anthocharis	64	batis, Thyatira	225
armoricana (didyma race), Melitæa	182	baton, Scolitantides 29, 107, 144,	187
armoricanus, Hesperia 27, 110,		bavius, Scolitantides	64
145, 148, 206		belemia, Anthocharis 8, 62, 63,	137
arsilache (pales race), Brenthis		belgiaria = fagaria	79
148, 149, 150, 151, 152, 153, 154,		belia = crameri	8, 63, 112, 226
artemis (aurinia race), Melitæa 72,		belisaria (aglaia ab.), Argynnis ..	77
73		bellargus (apollinus race), Doritis	
aruncella, Micropteryx	11, 12	62, 64	
asabinus, Thersamonia	28, 43	bellargus = thetis .. 131, 170, 171,	225
ascanius, Papilio	192	bellidice (daplidice race), Pontia ..	8
aspersana, Peronea, Acala 32,	202	berenice, Anosia	20
astrache = medon 75, 118, 131,		berytella, Micropteryx	11
132, 224		betulae, Ruralis 18, 65, 77, 142,	
atalanta, Pyrameis 18, 20, 54, 62,		147, 223, 224	
64, 65, 114, 138, 145, 147, 148,		betulae, Salebria	202
170, 192, 198, 224		betularia, Amphidasis	19, 20
atacaca (ægeria ab.), Pararge ..	127	betuletana, Eucosma	202
athalia, Melitæa 107, 131, 132, 143,		biarcuana, Ancyli	203
193, 194		bicolorana, Hylophila	50, 192
athalides (athalia ab.), Melitæa ..	194	bicoloria, Miana	74
atomaria, Ematurga	19, 55, 131	bidentata, Odontopera	60
atra, Acanthopsyche	165	biaseiana (revayana ab.), Sarro-	
*atrata (revayana ab.), Sarrothrips	136	thrips	76
atricomella, Elachista	201	bifidana = ferrugana	160
atropos, Manduca	80	bigenerata (machaon race), Papilio	
augustus (imperator var.), Parnas-		88, 89	
sus	150	Bijugis	165
aurago, Tiliacea	170	bilineata, Camptogramma 94, 131,	137
aurantiaria, Hybernica	49, 74	bitunana, Paedisca	14
aurata, Pyrausta	56	binaria, Drepana	33, 138, 192
aurelia, Melitæa	193	bipertita (pamphilus ab.), Cœno-	
aureliæformis (athalia race), Meli-		nympha	121
tea	193	birdella = mediopectinella	203
auricoma, Pharetra	134	bistortata, Tephrosia 80, 92, 99,	138

	PAGE		PAGE
biundularia, Tephrosia	59, 60, 176, 228	candida (cribrum race), Coscinia	137
boetica, Erynnis	27	canescens (revayana ab.), Sarro-	
boeticus, Lampides	5, 6, 7, 62, 70, 143, 153	thripus	136
bohemanni, Charaxes	118	canicularis (argiolus var.), Celas-	
boleti, Scardia	137	trina	47
bombyliiformis = tityus	73	capucina (oxyacanthæ ab.), Miselia	34
borealis (aglaia race), Argynnis	195	carbonellus (vitella ab.), Hypsilop-	
borealis (ligea race), Erebia	97	phus	201
boreata, Cheimatobia	34	cardamines, Euchloë	53, 54, 63, 65, 72, 73, 77, 78, 95, 109, 113, 131, 142, 157, 202, 228
bosphorana (didyma race), Melitæa	182	carduelis (cardui ab.), Pyrameis	198
bractea, Plusia	209	cardui, Pyrameis	54, 61, 64, 65, 71, 108, 114, 145, 157, 172, 197, 198, 200, 211, 224, 226
brassicæ, Barathra	92	carnella = semirubella	77
brassicæ, Pieris	18, 36, 53, 62, 65, 88, 92, 113, 131, 146, 172, 173, 226, 228	carniolica, Zygæna	132, 133, 172, 187
brevicauda (jasius ab.), Charaxes	179	carphodactyla, Hellensia	32, 98
briseis, Satyrus	77, 128, 129, 142, 147, 209	carpinata, Tricopteryx	19
**britannia (argiolus race), Celas-		carpini, Saturnia	95
trina	46	carthami, Hesperia	81, 110, 170, 173
britannia (tithonus race), Epine-		cassandra (polyxena race), Thais	88, 133
phele	123	cassioides (tyndarus race), Erebia	125
**britannorum (thetis race), Agri-		Castnia	117
ades	29, 30	castrensis, Malacosoma	187
brumata, Cheimatobia	34, 49	Catagramma	26, 138
**brunescens (revayana ab.),		Catocala	189, 226
Sarrothripus	136	catoleuca (brassica race), Pieris	88
Bucculatrix	201	caucasica (didyma race), Melitæa	180, 182, 184
bucephala, Phalera	92	caucasica (pales race), Brenthis	154
buoliana, Evetria	14	causicola (phœbe race), Melitæa	183, 184
burdigalæ (statilinus race), Hip-		celadussa (athalia race), Melitæa	193
parchia	128	celebensis (glaucippe race), Hebe-	
cacalia, Hesperia	81	moia	79
cæruleo-punctata (phlæas ab.), Ru-		celina (icarus ab.), Polyommatus	44, 45, 105
micia	78	celina = nigromaculata	54
cærulescens (cleopatra ab.), Gonep-		celsia, Jaspidia	170
teryx	87	Cemistoma	204
cæsonia, Meganostoma	212	cenea (merope), Papilio	138
cæspitiella, Coleophora	58	centrana, Tortrix	163
cæja, Arctia	42, 53, 55, 56, 58, 60, 78, 91, 92, 111	centripuncta (tiliæ ab.), Mimas	192
calabra (alciphron race), Loweia	28	centrovittana (hastiana ab.), Pero-	
calabra (galathea race), Melanargia	125	nea	60
calabrica (ægion race), Plebeius	45	cerberæ (iris ab.), Apatura	135
c-album, Polygonia	60, 80, 112, 131, 144, 146, 147, 173, 199, 200, 209, 224, 226	cerisyi, Thais	64
caledonia (megeira race), Pararge	126	ceto, Erebia	124
calidella (ficella), Ephestia	14	cetra (ceto race), Erebia	124
calidogenita (argiolus ab.), Celas-		chærophyllella, Epermenia	15
trina	46, 47	changaica (phœbe ab.), Melitæa	184
callidice, Pontia	137	Charaxes	118
calliopes (argyrognomon ab.),		charina, Pinacopteryx	38
Plebeius	46	charitonius, Heliconius	20
calliopis (argyrognomon ab.), Ple-		chestertoni (erato var.), Heliconius	116
beius	46	chi, Polia	114
calthella, Micropteryx	11, 12	chloridice, Pontia	137
camelina, Lophopteryx	50, 52	chlorodippe (cydippe ab.), Argynnis	196
camilla (rivularis), Limenitis	132, 133, 142, 146, 147, 170, 171, 179, 187, 188, 209, 210, 223, 224	chlorographa (ino ab.), Brenthis	222
camilla = sibilla	142, 179	christiarnana = citrinalis	118
camœna (ægëria ab.), Pararge	127	chrysippus, Danaïda	65
camœnæformis (ægëria ab.), Pararge	127	chrystis, Plusia	225
		chrysonome, Teracolus	64

	PAGE		PAGE
<i>Chrysophanus</i> ..	28, 97, 152	<i>cordula</i> , <i>Satyrus</i> ..	186
<i>chrysorrhœa</i> , <i>Euproctis</i> ..	18, 187	<i>coretas</i> = <i>alcetas</i> ..	144
<i>chrysotheme</i> , <i>Colias</i> ..	87	<i>coridon</i> , <i>Agriades</i> 29, 30, 44, 58, 75,	
<i>chrysotheme-formis</i> (<i>edusa</i> <i>ab.</i>),		77, 78, 80, 89, 90, 99, 110, 120,	
<i>Colias</i> ..	87	134, 142, 170, 171, 173, 186, 188,	
<i>ciliana</i> (<i>reticulata</i> <i>var.</i>), <i>Acalla</i> 58,		189, 206, 207, 208, 209, 210, 212,	
158, 159, 160, 162, 163, 164		223, 224, 225, 226	
<i>cimon</i> (<i>semiargus</i> <i>ab.</i>), <i>Polyom-</i>		<i>corinna</i> , <i>Cœnonympha</i> ..	143
<i>matus</i> (<i>Cyaniris</i>) ..	45	<i>coronata</i> , <i>Eupithecia</i> ..	60
<i>cinctaria</i> , <i>Boarmia</i> ..	211	<i>coronillæ</i> (<i>ephialtes</i> <i>ab.</i>), <i>Zygæna</i> 188	
<i>cinerascens</i> (<i>cleopatra</i> <i>ab.</i>), <i>Gonep-</i>		<i>corydon</i> (<i>thetis</i> <i>ab.</i>), <i>Agriades</i> ..	189
<i>teryx</i> ..	87	<i>corylana</i> , <i>Tortrix</i> ..	56
<i>cingulata</i> (<i>rhadamanthus</i> <i>ab.</i>),		<i>coryli</i> , <i>Demas</i> ..	50
<i>Zygæna</i> ..	138	<i>costosa</i> , <i>Depressaria</i> ..	203
<i>cinxia</i> , <i>Melitæa</i> 131, 142, 176, 183, 210		<i>cotyora</i> , <i>Perisama</i> ..	188
<i>cinxioides</i> (<i>phoebe</i> <i>ab.</i>), <i>Melitæa</i> ..	183	<i>Crambi</i> ..	113
<i>circe</i> , <i>Satyrus</i> 67, 129, 142, 158,		<i>cramerella</i> , <i>Lithocolletis</i> ..	14
186, 187, 223, 225		<i>crameri</i> (<i>belia</i>), <i>Anthocharis</i> 8, 63,	
<i>cirsii</i> , <i>Hesperia</i> ..	82	107, 108, 112, 143, 157, 226	
<i>citrango</i> , <i>Xanthia</i> ..	169	<i>crassemaculosa</i> (<i>statilinus</i> <i>ab.</i>),	
<i>citrana</i> , <i>Cydia</i> ..	201	<i>Hipparchia</i> ..	129
<i>citrata</i> (<i>immanata</i>), <i>Dysstroma</i> 55,		<i>cratægata</i> (<i>luteolata</i>), <i>Opistho-</i>	
<i>citrinalis</i> (<i>christiannana</i>), <i>Hyper-</i>		<i>graptis</i> ..	55, 93, 224
<i>callia</i> ..	118	<i>cratægi</i> , <i>Aporia</i> 64, 88, 131, 132, 142	
* <i>cladodes</i> (<i>revayana</i> <i>ab.</i>), <i>Sarro-</i>		<i>crenata</i> , <i>Glyphisia</i> ..	51
<i>thripus</i> ..	136	<i>crepuscularia</i> , <i>Tephrosia</i> 80, 173,	
<i>clara</i> (<i>mendica</i> <i>race</i>), <i>Diaphora</i> 102, 103		176, 224	
<i>clara</i> , <i>Argynnis</i> ..	150	<i>creosphontes</i> , <i>Papilio</i> ..	20
<i>clara</i> (<i>sylvanus</i> <i>ab.</i>), <i>Augiades</i> ..	28	<i>creta</i> (<i>manni</i> <i>race</i>), <i>Pieris</i> ..	88
<i>clarens</i> (<i>cydippe</i> <i>ab.</i>), <i>Argynnis</i> ..	196	<i>cretaticostella</i> , <i>Coleophora</i> ..	115
<i>clathrata</i> , <i>Strenia</i> ..	95, 118, 131	<i>cribrum</i> , <i>Coscinia</i> ..	137
<i>clavipalpis</i> (<i>cubicularis</i>), <i>Athetis</i> ,		<i>crinanensis</i> , <i>Hydroecia</i> 12, 13, 14,	
<i>Caradrina</i> ..	156	33, 74, 99, 177, 178, 212	
<i>cleo</i> (<i>tyndarus</i> <i>race</i>), <i>Erebia</i> ..	125	<i>cristana</i> , <i>Peronea</i> ..	140
<i>cleodoxa</i> (<i>cydippe</i> <i>ab.</i>), <i>Argynnis</i>		<i>cristatella</i> , <i>Bucculatrix</i> ..	201
186, 187, 210		<i>croceus</i> = <i>edusa</i> 69, 70, 87, 106,	
<i>cleopatra</i> , <i>Gonepteryx</i> 64, 69, 87,		107, 108, 121, 147, 148	
107, 108, 146, 147		<i>cruciferarum</i> , <i>Plutella</i> ..	79
<i>cleusei</i> (<i>dorilis</i> <i>ab.</i>), <i>Loweia</i> 29, 43		<i>cubei</i> (<i>stygne</i> <i>ab.</i>), <i>Erebia</i> ..	24
<i>coenia</i> , <i>Junonia</i> ..	20	<i>cubicularis</i> = <i>clavipalpis</i> ..	156
<i>cognatellus</i> , <i>Hyponomeuta</i> ..	201	<i>eucubali</i> , <i>Dianthœcia</i> ..	73
<i>Coleophora</i> ..	98, 114, 136	<i>Cupido</i> ..	107
<i>colombina</i> (<i>erato</i> <i>form.</i>), <i>Heliconius</i> 116		<i>cyanosticta</i> (<i>io</i> <i>ab.</i>), <i>Vanessa</i> ..	120
<i>columbanus</i> (<i>alciphron</i> <i>race</i>),		<i>cydippe</i> (<i>adippe</i>), <i>Argynnis</i> 77, 78,	
<i>Loweia</i> ..	28	118, 142, 186, 187, 196, 210	
<i>comes</i> , <i>Triphæna</i> ..	74, 225	<i>cydippe</i> (<i>niobe</i> <i>ab.</i>), <i>Argynnis</i> ..	189
<i>comma</i> , <i>Urbicula</i> 142, 209, 210, 223, 224		<i>cyllarus</i> , <i>Glaucopsyche</i> 29, 31, 45,	
<i>completa</i> (<i>cyllarus</i> <i>ab.</i>), <i>Glauco-</i>		131, 132, 133, 134, 142, 189, 206	
<i>psyche</i> ..	29	<i>cymothoë</i> (<i>athalia</i> <i>race</i>), <i>Melitæa</i> ..	194
<i>conehana</i> = <i>rivulana</i> ..	203	<i>cynara</i> , <i>Hesperia</i> ..	81, 83
<i>confusalis</i> , <i>Nola</i> ..	60	<i>dalmatina</i> (<i>didyma</i> <i>race</i>), <i>Melitæa</i>	
<i>conjuncta</i> (<i>cardui</i> <i>ab.</i>), <i>Pyrameis</i> ..	197	181, 182	
<i>connexa</i> (<i>urticæ</i> <i>race</i>), <i>Aglais</i> ..	119	<i>daphne</i> , <i>Brenthis</i> ..	142
<i>consequana</i> , <i>Acrolita</i> ..	57	<i>daplidice</i> , <i>Pontia</i> 7, 8, 62, 64, 65,	
<i>consociella</i> , <i>Acrobasis</i> ..	14	87, 88, 108, 121, 137, 147, 148,	
<i>consortaria</i> , <i>Boarmia</i> ..	173	176, 187, 210, 223, 224, 225, 226	
<i>conspersa</i> , <i>Dianthœcia</i> ..	73	<i>darjana</i> (<i>pales</i> <i>race</i>), <i>Brenthis</i> ..	155
<i>conspicillaris</i> , <i>Xylomiges</i> ..	138	<i>debiliata</i> , <i>Eupithecia</i> ..	60
<i>constantinii</i> (<i>mnemosyne</i> <i>race</i>),		<i>decora</i> (<i>apollo</i> <i>ab.</i>), <i>Parnassius</i> ..	88
<i>Parnassius</i> ..	189	<i>decoraria</i> (<i>subroseata</i>) (<i>pendularia</i>	
<i>constantinii</i> (<i>stygne</i> <i>race</i>), <i>Erebia</i> ..	189	<i>ab.</i>), <i>Cosymbia</i> ..	137
<i>contaminana</i> = <i>reticulata</i> 58, 158,		<i>decoratissima</i> (<i>apollo</i> <i>ab.</i>), <i>Par-</i>	
159, 160, 161, 162, 163, 164, 204		<i>nassius</i> ..	88
<i>contigua</i> , <i>Hadena</i> ..	52	<i>defoliaria</i> , <i>Hibernia</i> 34, 49, 75, 99,	
<i>corcyrella</i> , <i>Micropteryx</i> ..	11	111, 138, 176	

	PAGE
deione, <i>Melitæa</i>	193
deioneformis (<i>athalia ab.</i>), <i>Melitæa</i>	193
delamerensis (<i>biundularia ab.</i>), <i>Tephrosia</i>	59, 60
deleta (<i>phœbe ab.</i>), <i>Melitæa</i> ..	184
delminia (<i>athalia ab.</i>), <i>Melitæa</i> ..	193
deminuta (<i>briseis ab.</i>), <i>Satyrus</i> ..	129
demoleus, <i>Papilio</i>	138
dentalis, <i>Cynæda</i>	156
*depicta (<i>revayana ab.</i>), <i>Sarro-</i> <i>thripus</i>	136
deplana, <i>Lithosia</i>	78, 134, 170
Depressaria	18
depuiseti, <i>Euplœa</i>	20
deserticola (<i>didyma race</i>), <i>Melitæa</i> 7, 65, 180, 182	156
deserticola (<i>irrisor race</i>), <i>Cardepi</i>	156
deyrollei (<i>cerisy ab.</i>), <i>Thais</i> ..	64
dia, <i>Brenthis</i> 108, 147, 148, 186, 194, 209, 210, 223, 224	50
dictæa = tremula	73
dictæoides, <i>Pheosia</i>	190
dictynna, <i>Melitæa</i>	7, 65, 71, 105, 107, 113, 131, 132, 133, 145, 172, 173, 179, 180, 181, 182, 184, 223, 229
didyma, <i>Melitæa</i>	187
didyma = secalis	55
didymata, <i>Malenydris</i>	224
dilucidaria, <i>Gnophos</i>	51
diluta, <i>Asphalia</i>	76
dilutana (<i>revayana ab.</i>), <i>Sarro-</i> <i>thripus</i>	34
dilutata, <i>Epirrita</i>	135
dimeres (<i>iris ab.</i>), <i>Apatura</i> ..	164
dimidiana (<i>reticulata ab.</i>), <i>Acala</i> ..	47
diminuta (<i>alcetas ab.</i>), <i>Everes</i> ..	194
diniensis (<i>athalia race</i>), <i>Melitæa</i> ..	201
discordella, <i>Coleophora</i>	20
disippus, <i>Limenitis</i>	78, 97, 144
dispar, <i>Chrysophanus</i>	43, 188, 191, 192, 210, 224
dispar, <i>Lymantria</i> , <i>Liparis</i> ..	165
Dissoctena	63
distincta (<i>belemia ab.</i>), <i>Antho-</i> <i>charis</i>	197
dives (<i>paphia race</i>), <i>Dryas</i> ..	60
divisiona (<i>hastiana ab.</i>), <i>Peronea</i> ..	60
dolobrararia, <i>Eurymene</i>	110, 119
dolus, <i>Hirsutina</i> , <i>Polyommatus</i> ..	111
dominula, <i>Callimorpha</i>	29, 109, 131, 146, 147, 186
dorilis, <i>Loweia</i>	125
doris (<i>galathea ab.</i>), <i>Melanargia</i> ..	122, 123
dorus, <i>Cœnonympha</i>	19
doubledayaria (<i>betularia ab.</i>), <i>Pachys</i> , <i>Amphidasis</i>	50, 56, 73
dromedarius, <i>Notodonta</i>	142
dryas, <i>Enodia</i> , <i>Satyrus</i>	18
dubitalis, <i>Scoparia</i>	49, 50, 51, 52, 53
duplaris, <i>Cymatophora</i>	61, 64, 69, 70, 77, 87, 94, 106, 107, 108, 131, 132, 133, 135, 147, 148, 176, 187, 188, 210, 212, 224, 225, 226

	PAGE
egea, <i>Polygonia</i> 144, 146, 147, 200, 201	
egerides (<i>ægeria race</i>), <i>Pararge</i> 65, 112, 113, 127, 128, 176	
egestas (<i>ægeria race</i>), <i>Pararge</i> ..	127
egestasiformis (<i>ægeria ab.</i>), <i>Pararge</i>	127
egyptiaca (<i>crameri race</i>), <i>Antho-</i> <i>charis</i>	8
egyptiaca (<i>telicanus race</i>), <i>Langia</i> 5, 6, 7	
electa, <i>Catocala</i> 187, 188, 210, 223	
elegantia (<i>ægeria ab.</i>), <i>Pararge</i> ..	127
elegantiaformis (<i>ægeria ab.</i>), <i>Pararge</i>	127
eleus (<i>phlœas race</i>), <i>Rumicia</i> 61, 78	
elinguaria, <i>Crocallis</i>	228
elpenor, <i>Eumorpha</i>	37, 50, 135
elutata = furcata	55
elymi (<i>cardui ab.</i>), <i>Pyrameis</i> ..	191
emielymi (<i>cardui ab.</i>), <i>Pyrameis</i> ..	198
emiaustralis (<i>pamphilus race</i>), <i>Cœnonympha</i>	121, 122
emiflorens (<i>lathonia ab.</i>), <i>Issoria</i> ..	195
emibispulla (<i>jurtina race</i>), <i>Epine-</i> <i>phela</i>	123, 124
emilocuples (<i>aglaia race</i>), <i>Argynnis</i> 195, 196	
emilyllus (<i>pamphilus race</i>), <i>Cœno-</i> <i>nympha</i>	71, 72, 121, 122
emilyssa (<i>megea race</i>), <i>Pararge</i> ..	126
emipauper (<i>phœbe race</i>), <i>Melitæa</i> 182, 183	
emipunica (<i>phœbe race</i>), <i>Melitæa</i> 182, 183, 184	
emisphyrus (<i>machaon race</i>), <i>Papilio</i> 88, 89	
eucaustus, <i>Glottula</i>	212
Ennomidæ	55
eos (<i>ilia ab.</i>), <i>Apatura</i>	178
epaphia, <i>Glutophrissa</i>	118
Ephestia	20
ephialtes, <i>Zygæna</i>	188
epimolpadia (<i>aurina ab.</i>), <i>Melitæa</i>	207
eppelsheimi, <i>Aristotelia</i>	10
erato, <i>Heliconius</i>	116
erctella, <i>Micropteryx</i>	11
Erebia	97
eremita (<i>monacha ab.</i>), <i>Lymantria</i>	140
ericetaria (<i>plumaria</i>), <i>Selidosema</i> 74, 207	
ericoides, <i>Coleophora</i>	136
erosaria, <i>Ennomos</i>	36, 140
erycina, <i>Castnia</i>	117
erythromelas, <i>Eugonia</i>	199
escheri, <i>Agriades</i> 31, 70, 108, 110, 142, 171, 173	
esculi (<i>ilicis ab.</i>), <i>Nordmannia</i> ..	47
esperi = <i>crameri</i>	157
esperi = <i>cydippe</i>	142, 196
esperi = <i>græca</i>	157
ethalion, <i>Charaxes</i>	96, 118
ethocles, <i>Charaxes</i>	96, 118
etruriae (<i>stygne race</i>), <i>Erebia</i> ..	124
etrusca (<i>thetis race</i>), <i>Agriades</i> 29, 30	
etrusca (<i>tithonus race</i>), <i>Epinephela</i>	123
eubule, <i>Catopsilia</i>	211

	PAGE		PAGE
eugenia, Morpho	117	fluctuosa, Cymatophora	51
euneus, Clerome	19	fontis, Bomolocha	60
euonymellus, Hyponomeuta ..	60	forskahliana, Tortrix	163
eupales (pales race), Brenthis	150, 154	forsterana, Tortrix	99
eupheme, Zegris	64	fortunata (jurtina race), Epinephele	124
euphorbiae, Hyles	172	fowleri (coridon ab.), Agriades ..	207
euphrosyne, Brenthis	59, 60, 78, 192	fritillum, Hesperia	81, 82
Eupithecia	192	fuciformis, Hemaris	138
Euploea	20, 78	fulgens (tithonus race), Epinephele	123
europaeus (cleopatra race), Gonep-		fuliginosa, Phragmatobia	78, 111, 187
teryx	87	fulvago, Xanthia, Citria	51
euryale, Erebia	97	fulvaticata (grossulariata ab.),	
evanthe, Teracolus	79	Abraxas	58
exanthemaria, Cabera	171	fulvata, Cidaria	55
exclamationis, Agrotis	51	fulvior = phocas	29
exigua, Laphygma	156	fulvoinspersa (armoricanus ab.),	
eximiella, Micropteryx	11, 12	Hesperia	27
exoleta, Calocampa	50	fulvotincta (onopordi ab.), Hesperia	27
expansa (daplidice race), Pontia	87, 88	**fumosa (ericetaria ab.), Seli-	
exquisita (grossulariata ab.), Ab-		donta	74
raxas .. 16, 17, 34, 35, 205, 206		furcata (elutata ab.), Hydriomena	55
**exquisita-aenea (grossulariata		furcula, Cerura	73, 192
ab.), Abraxas	205	fusca (progemmaria ab.), Hibernia	138
extensa (sylvanus ab.), Augiades ..	28	fuscata (marginaria ab.), Lomaspilis	212
extersaria, Tephrosia	49	fuscedinella, Coleophora	202
fagaria (belgiaria), Scodiona ..	79	fusculana (revayana ab.), Sarro-	
fagi, Stauropus	95	thripus	76
falcataria, Drepana	14, 56	galathea, Melanargia 125, 126, 134,	
**fasciata (revayana ab.), Sarro-		142, 157, 158, 170, 171, 172, 173,	
thripus	136	189, 207	
fatua, Satyrus	12	galba, Zizeeria	137
fatuaeformis (statilinus race), Sa-		Galleriide	134
tyrus	129	gamma, Plusia	156
fausta, Idmais, Teracolus .. 7, 61,	137	generator (pales race), Brenthis	
febretta, Amicta	156	150, 151, 154, 155	
fenestrella, Thyris	172	geneveva, Junonia	211
fergana (briseis race), Satyrus ..	77	genistæ, Coleophora	18, 204
ferrugana, Tortrix	160, 163	Geometridæ	55
festaliella, Schreckenstenia ..	202	geryon, Adscita	211
festucae, Plusia	73	gigas (pamphilus race), Cæno-	
ficella = calidella	14	nympha	121, 122
fidia, Satyrus	128, 170	glabraria, Cleora	192
fidiaeformis (statilinus race), Sa-		glabrattella, Blastotere	14
tyrus	128, 129	glaucata, Cilix	72, 225
fimbria, Triphaena	50, 52	glauce (belemia race), Anthocharis	
fimbrialis (thymiaria), Thaleria	132, 171	8, 63	
filipendulae, Zygaena	55, 93	glaucippe, Hebemoia	79
fissella (vittella ab.), Hypsilophus	201	glaucanome, Synchloë, Pontia 7, 8,	65
flava (thaumas), Adopaea .. 65, 132,		goante, Erebia	124
142, 173, 187, 211		Gonepteryx	66, 67, 148
flava (crataegi ab.), Aporia	88	gordius (alciphron race), Loweia	
flavens (athalia ab.), Melitaea ..	194	28, 119	
flavescens (fulvago ab.), Xanthia,		gracilis (arcania race), Cænonym-	
Citria	51	pha	123
flavipalliatæ (grossulariata ab.),		gracilis (sao ab.), Powellia	28
Abraxas	205	græca (crameri race), Anthocharis	157
floralis, Noctuella	156	græca (didyma race), Melitæa 180,	
florella, Catopsilia	7, 65	181, 182	
florens (lathonia ab.), Issoria ..	195	græca = (esper) (crameri), Antho-	
florentina (galathea race), Melan-		charis	63, 64, 157
argia	125, 126	græca (pales race), Brenthis ..	151, 155
florida (hecate ab.), Brenthis ..	195	graminis, Charæas	36
floridensis, Limenitis	20	granadensis (alciphron race), Low-	
florina (galathea race), Melanargia	125	eia	119
fluctuata, Xanthorhoe	55, 92, 131	granifera, Coleophora	136

	PAGE		PAGE
grossulariata, Abraxas	16, 17, 34, 55, 58, 76, 78, 89, 90, 92, 201, 250	135, 138, 145, 148, 157, 208, 209, 210, 212, 223	
gruneri, Euchloë	.. 64	ichneumoniformis, Aegeria	.. 140
grypbipennella, Coleophora	.. 202	ichnusa (urticæ race), Aglais	77, 199
Grypocera	.. 70, 110	ida, Epinephele	.. 142
halias, Lycorea	.. 20	idas=argyrognomon	46, 68, 145, 189
halterata, Lobophora	.. 49, 60	ilia, Apatura	.. 143, 178, 190
hamula, Drepana	.. 50	iliciana (revayana ab.), Sarothripus	76
hanno, Lycæna	.. 20	ilicis, Nordmannia, Thecla	47, 142, 186
hastiana, Peronea	.. 60	illecebra (circe race), Satyrus	.. 129
hecate, Brenthis	.. 142, 195	immaculata (paphia ab.), Dryas	.. 197
helice (edusa ab.), Colias	.. 64, 77	immanata=citrata	.. 55, 74
belicina (edusa ab.), Colias	77, 212	imperator, Parnassius	.. 150
heloides (lesbia ab.), Colias	.. 212	impluviata, Hydriomena	.. 72
belvetica (athalia race), Melitæa	.. 193	impura, Leucania	.. 52
helveticata, Eupithecia	.. 116	inalpina (thetis race), Agriades	29, 30
helvola (rufina), Amathes	.. 50, 224	indica, Pyrameis	.. 198
Hemimene	.. 203	inducta (pales ab.), Brenthis	151, 153, 154
heparana, Tortrix, Pandemis	57, 58	infrabrunnea (cardui ab.), Pyra- meis	.. 198
hera, Callimorpha	188, 209, 210, 223	infraflava (cardui ab.), Pyrameis	.. 198
herbida, Apecta	.. 51	infragrisea (cardui ab.), Pyrameis	.. 198
herculeana, Thaumatopea	.. 156	infranigrans (cardui ab.), Pyrameis	198
herculeana (camilla race), Limenitis	179	infraochracea (cardui ab.), Pyra- meis	.. 198
hermione (major), Satyrus	70, 142, 187, 188, 209	infraochreatea (cratægi ab.), Aporia	88
Hesperia	.. 81, 82, 227	infragentea (tyndarus ab.), Erebia	125
Hesperia = Syricthus	.. 174	infulvata (alciphron ab.), Loweia	.. 119
Hesperiidæ	.. 184, 212	infumata (pavonia ab.), Saturnia	.. 36
heterodactyla (teucii), Oxyptilia	.. 33	Ino	.. 7
hibernata (thersites race), Agriades	44	ino, Brenthis	.. 149, 228
hibernica (aurinia race), Melitæa	.. 73	inops (cardui ab.), Pyrameis	.. 198
hippotoë, Chrysophanus	.. 97	inornata, Acidalia	.. 49
hirtaria, Lycia	.. 137	inornata (polyxena ab.), Thais	.. 88
hispulla (jurtina race), Epinephele	123, 124, 186, 211	insignis, Clothida	.. 138
hospita (plantaginis race), Para- semia	.. 137, 190	instabilella, Lita	.. 201
humuli, Hepialus	.. 55	instabilis, Taeniacampa	.. 138
humiliata (osseata), Ptychopoda	.. 171	insubrica (arcania race), Coeno- nympha	.. 123
hutchinsonii (c-album ab.), Poly- gonia	.. 200	insulana, Earias	.. 156
hyale, Colias	94, 112, 113, 131, 132, 147, 148, 186, 210, 223, 224, 225, 226	interjecta (briseis ab.), Satyrus	.. 129
Hyalina	.. 167	interjecta (quercus ab.), Bithys	.. 48
hydaspes, Catagramma	.. 26	interjecta (thersites ab.), Agriades	44
Hydrecia	.. 12, 33	interligata (lathonia ab.), Issoria	.. 228
hylas, Polyommatus	.. 30, 31, 144	interligata (selene ab.), Brenthis	.. 228
hyperantus, Aphantopus	54, 65, 78, 93, 211	intermedia (aegeria ab.), Pararge	.. 127
hyperapennina (medusa race), Erebia	.. 189	intermedia (alciphron ab.), Loweia	28, 43, 119
hypericana, Epinotia	.. 14	intermedia (belemia ab.), Antho- charis	.. 63
hyperion = protodamas, Papilio	.. 212	intermedia (lupinus ab.), Epine- phele	.. 205
hypermnestra = polyxena	88, 142	intermedia (phlaeas ab.), Rumicia	78
Hyponephele	.. 205	interrogationis, Plusia	.. 73, 135
ianthinana, Laspeyresia	.. 56	io, Vanessa	65, 89, 90, 119, 120, 131, 144, 145, 192, 224
iberica (ægon race), Plebeius	.. 46	iochalcea (grossulariata ab.), Ab- raxas	.. 205
iberica (athalia race), Melitæa	.. 193	iola (iris ab.), Apatura	.. 135
iberica (quercus race), Bithys	.. 48	iota, Plusia	.. 73
icarinus (icarus ab.), Polyommatus	19, 135, 208	iris, Apatura	.. 114, 135, 191, 228
icarus, Polyommatus	6, 14, 19, 20, 44, 53, 55, 61, 62, 64, 65, 68, 69, 71, 73, 74, 75, 76, 78, 79, 104, 105, 109, 114, 118, 119, 131, 133,	irregularis-obsoleta (coridon ab.), Agriades	.. 77

	PAGE		PAGE
irrisor, <i>Cardepia</i>	156	libanotica (<i>lycaon race</i>), <i>Epine-</i>	
irrorella, <i>Setina</i>	32, 171	phele	205
isis (<i>pales race</i>), <i>Brenthis</i> ..	152, 154	* <i>lichenodes</i> (<i>revayana ab.</i>), <i>Sarro-</i>	
itala (<i>circe race</i>), <i>Satyrus</i> ..	129	thripus	136
italica (<i>acaciae race</i>), <i>Nordmannia</i>	48	ligea, <i>Erebria</i>	97, 108
italica (<i>aegeria race</i>), <i>Pararge</i>	127, 128	ligniperda, <i>Cossus</i>	132
italica (<i>alcon race</i>), <i>Lycæna</i> ..	189	ligula, <i>Orrhodia</i>	49
italica (<i>cleopatra race</i>), <i>Gonepteryx</i>	87	ligurica, <i>Plebeius</i>	68, 145
italorum (<i>ægon race</i>), <i>Plebeius</i> ..	45	ligustri, <i>Sphinx</i>	59, 60
italorum (<i>dorilis race</i>), <i>Loweia</i> ..	29	lilliputana (<i>didyma ab.</i>), <i>Melitæa</i>	182
jacobææ, <i>Hypocrita</i>	135, 170, 171	linariae = <i>lunula</i>	134
janira = <i>jurtina</i>	54, 124	lineola, <i>Adopaea</i>	28, 142
janthina, <i>Triphæna</i>	77	literosa, <i>Miana</i>	74
japonica (<i>cardui race</i>), <i>Pyrameis</i>	197	Lithocolletis	140, 202
jasius, <i>Charaxes</i>	144, 179	lithodactyla, <i>Oedematophora</i> ..	32
javanensis (<i>glauippe race</i>), <i>Hebe-</i>		litrata, <i>Semiothisa</i>	175
moia	79	livia, <i>Virachola</i>	6
jesous, <i>Azanus</i>	65	lixella, <i>Coleophora</i>	201
johannæ (<i>loewii ab.</i>), <i>Plebeius</i> ..	7	locuples (<i>aglaia race</i>), <i>Argynnis</i>	
jorulla, <i>Rothschildia</i>	37	195, 196	
judæa (<i>herculeana race</i>), <i>Thauma-</i>		loeflingiana, <i>Tortrix</i>	202
topæa	156	loewii, <i>Plebeius</i>	6, 7
juldussica (<i>pales race</i>), <i>Brenthis</i> ..	155	logiana, <i>Acalla</i>	14
jurtina (<i>janira</i>), <i>Epinephele</i> 54, 65,		longana, <i>Tortrix</i>	14
70, 74, 75, 77, 78, 93, 94, 110,		loniceræ, <i>Zygaena</i>	131, 135, 171
114, 123, 124, 132, 133, 142, 170,		lota, <i>Orthosia</i> , <i>Amathes</i> ..	50, 74
186, 208, 211, 212, 224		lubricipeda, <i>Spilosoma</i>	55
karsandra, <i>Zizeeria</i>	5, 61, 62, 157	lucasi, <i>Melanargia</i>	126
kershawii, <i>Pyrameis</i>	198	lucens, <i>Hydroecia</i>	14, 74
killiasi (<i>pales race</i>), <i>Brenthis</i> 150, 154		lucina, <i>Hamearis</i>	111, 142, 158
korla (<i>pales race</i>), <i>Brenthis</i> 150, 203, 204		luctuosa, <i>Acontia</i>	132, 170, 224
laburnella, <i>Cemiosoma</i>	203, 204	Luffia	165
lacertinaria (<i>lacertula</i>), <i>Drepana</i> 50, 56		lunensis (<i>ægon race</i>), <i>Plebeius</i> 45, 46	
lacticolor (<i>grossulariata ab.</i>),		lunula (<i>linariae</i>), <i>Calophasia</i> 134, 171	
<i>Abraxas</i>	205	lupinus, <i>Hyponephele</i> 142, 147,	
<i>laetior</i> (<i>dia var.</i>), <i>Brenthis</i> ..	194	204, 205	
lambillioni (<i>ilia ab.</i>), <i>Apatura</i> ..	190	luridata, <i>Tephrosia</i>	60, 211
lampon, <i>Thersamonia</i>	28	lusoria, <i>Toxocampa</i>	187
lantanelia, <i>Lithocolletis</i>	15	luteissima (<i>ilia ab.</i>), <i>Apatura</i> ..	178
lapponica (<i>pales race</i>), <i>Brenthis</i>		luteolata (<i>crategata</i>), <i>Opisthograptis</i>	
152, 153, 154		<i>Rumia</i>	55, 224
larissa, <i>Melanargia</i>	157	lutescens (<i>c-album ab.</i>), <i>Polygonia</i>	200
latenigrata (<i>pamphilus race</i>),		luteumfera (<i>alcetas ab.</i>), <i>Everes</i> ..	47
<i>Cænonympha</i>	122	lutipennella, <i>Coleophora</i>	202
latevittata (<i>pamphilus ab.</i>), <i>Cæno-</i>		lutosa, <i>Calamia</i>	74
<i>nympha</i>	122	Lycænidæ	96, 110, 133, 171, 184
latevittata (<i>polyxena race</i>), <i>Thais</i>	88	Lycænidi	44
lathamianus (<i>revayana ab.</i>), <i>Sarro-</i>		lycaon, <i>Hyponephele</i>	204, 205
thripus	76	lykeia (<i>depuiseti ab.</i>), <i>Euplœa</i> ..	20
lathonia, <i>Issoria</i> 78, 108, 131, 132,		lylides (<i>pamphilus var.</i>), <i>Cæno-</i>	
133, 147, 170, 195, 210, 226, 228		<i>nympha</i>	121, 122
laura (<i>ilia ab.</i>), <i>Apatura</i>	178	lyllus (<i>pamphilus var.</i>), <i>Cæno-</i>	
lavatheræ, <i>Erynnis</i> 27, 72, 110, 142, 172		<i>nympha</i>	121, 122
lecontei (<i>marcellus var.</i>), <i>Papilio</i> ..	18	lyssa (<i>megea var.</i>), <i>Pararge</i> ..	126
lefebvrei, <i>Gegenes</i>	106, 110, 143	maccabæus (<i>alexanor ab.</i>), <i>Papilio</i>	64
leonina (<i>athalia race</i>), <i>Melitæa</i> ..	194	machaon, <i>Papilio</i> 7, 61, 64, 88, 89,	
leplastriana, <i>Grapholitha</i>	36	112, 130, 131, 132, 147, 184,	
leporina, <i>Acronicta</i> 19, 52, 56, 211, 212		187, 190	
lesbia, <i>Colias</i>	212	macilenta, <i>Amathes</i>	74
leschenaulti, <i>Oreopsyche</i>	167	macromma (<i>arcania race</i>), <i>Cæno-</i>	
leucophaæa, <i>Hibernia</i>	135, 137	<i>nympha</i>	123
leucophaæa (<i>nastiana ab.</i>), <i>Peronea</i>	60	maculata, <i>Tortrix</i>	163
leucostigma, <i>Apamea</i>	177, 178	mæra, <i>Pararge</i>	127, 144, 170, 210
leucostigma, <i>Helotropha</i>	74	magna (<i>athalia ab.</i>), <i>Melitæa</i> ..	193
leucostigma, <i>Orgyia</i>	35	magnata (<i>paphia ab.</i>), <i>Dryas</i> 196, 197	

	PAGE
<i>magnifica</i> (<i>paphia</i> race), <i>Dryas</i> 196, 197	
<i>mainalia</i> (<i>cydippe</i> race), <i>Argynnis</i> 196	
<i>maja</i> (<i>thetis</i> var.), <i>Agriades</i> .. 29	
<i>major</i> = <i>hermione</i> 70, 142	
<i>major</i> (<i>spini</i> race), <i>Nordmannia</i> .. 48	
<i>malve</i> , <i>Hesperia</i> 19, 60, 81, 82, 83, 131, 133, 170, 206, 225	
<i>malvoides</i> , <i>Hesperia</i> 28, 68, 70, 81, 82, 83, 143, 206	
<i>manica</i> , <i>Charaxes</i> 118	
<i>manis</i> (<i>clara</i> race), <i>Brenthis</i> .. 150	
<i>manni</i> , <i>Pieris</i> .. 88, 119, 146, 147	
<i>marcellus</i> (<i>ajax</i>), <i>Papilio</i> 18	
<i>mareotica</i> , <i>Acidalia</i> 156	
<i>mareoticus</i> (<i>ballus</i> race), <i>Thestor</i> 6	
<i>marginata</i> (<i>coridon</i> ab.), <i>Agriades</i> 78	
<i>marginaria</i> (<i>progemma</i>), <i>Hibernia</i> 138, 212	
<i>marginata</i> , <i>Lomasipilis</i> 72, 135, 171, 187	
<i>marginata</i> (<i>pamphilus</i> ab.), <i>Coenonympha</i> 121, 122	
<i>marginepunctata</i> , <i>Acidalia</i> .. 138	
<i>marmorea</i> (<i>statilinus</i> race), <i>Satyrus</i> 128	
<i>maritima</i> (<i>statilinus</i> var.), <i>Satyrus</i> 128	
<i>masseyi</i> (<i>aegon</i> race), <i>Plebeius</i> 77, 208	
<i>mathias</i> , <i>Parnara</i> 5	
<i>mauretanica</i> (<i>didyma</i> race), <i>Melitæa</i> 179, 180, 182	
<i>maxima</i> (<i>athalia</i> var.), <i>Melitæa</i> 193, 194	
<i>mayrana</i> (<i>hastiana</i> ab.), <i>Peronea</i> 60	
<i>mediofasciata</i> (<i>pales</i> ab.), <i>Brenthis</i> 154	
<i>mediofusca</i> (<i>dispar</i> ab.), <i>Lymantria</i> 191	
<i>mediolugens</i> (<i>mege</i> ab.), <i>Pararge</i> 78	
<i>mediopectinella</i> (<i>birdella</i>), <i>Ochsenheimeria</i> 203	
<i>mediterraneæ</i> , <i>Tarucus</i> .. 62, 65, 190	
<i>medon</i> (<i>astrarche</i>), <i>Aricia</i> 45, 58, 65, 75, 77, 78, 105, 109, 118, 131, 132, 133, 146, 209, 224	
<i>medusa</i> , <i>Erebia</i> 189	
<i>mege</i> ra, <i>Pararge</i> 54, 59, 65, 69, 72, 78, 80, 109, 126, 127, 131, 146, 147, 148, 168, 206, 224, 225, 226	
<i>mehadiensis</i> (<i>athalia</i> ab.), <i>Melitæa</i> 193	
<i>melanops</i> , <i>Glaucoopsyche</i> 132, 133, 134, 206	
<i>melanoptera</i> (<i>striata</i> ab.), <i>Coscinia</i> 137	
<i>**melanosticta</i> (<i>revayana</i> ab.), <i>Sarothrips</i> 136	
<i>melanthes</i> (<i>ilia</i> ab.), <i>Apatura</i> .. 190	
<i>meleager</i> , <i>Polyommatus</i> 142, 186, 187, 188	
<i>meliboëus</i> (<i>alciphron</i> race), <i>Loweia</i> 28, 119	
<i>meliloti</i> , <i>Zygaena</i> 60	
<i>melisanda</i> (<i>ausonia</i> race), <i>Anthocharis</i> 63, 64	
<i>Melitæa</i> 210	
<i>melotis</i> , <i>Hesperia</i> .. 28, 81, 82, 83	
<i>melpomene</i> , <i>Heliconius</i> 79	
<i>menalcas</i> (<i>dolus</i> race), <i>Polyommatus</i> 119	

	PAGE
<i>mendica</i> , <i>Diaphora</i> 55, 73, 101, 102, 103, 104, 132, 168, 192	
<i>menthastri</i> , <i>Spilosoma</i> .. 55, 212	
<i>meridiana</i> (<i>thersites</i> race), <i>Agriades</i> 43, 44	
<i>meridionalis</i> (<i>didyma</i> race), <i>Melitæa</i> 181, 182	
<i>meridionalis</i> (<i>icarus</i> race), <i>Polyommatus</i> 44	
<i>merope</i> = <i>cenea</i> 138	
<i>mesentina</i> , <i>Belenois</i> .. 7, 61	
<i>mesomella</i> , <i>Cybosia</i> 187	
<i>mi</i> , <i>Euclidia</i> 131	
<i>micæa</i> , <i>Hydroecia</i> , <i>Gortyna</i> 13, 35	
<i>micromaritima</i> (<i>statilinus</i> var.), <i>Satyrus</i> 128	
<i>microproci</i> da (<i>galathea</i> var.), <i>Melanargia</i> 125	
<i>Micropteryx</i> 10, 11	
<i>minimus</i> , <i>Cupido</i> 14, 47, 108, 135, 143, 171, 173, 201	
<i>minna</i> , <i>Cidaria</i> 140	
<i>minor</i> (<i>cardui</i> ab.), <i>Pyrameis</i> .. 198	
<i>minorata</i> , <i>Craspedia</i> 156	
<i>minuta</i> (<i>spini</i> ab.), <i>Nordmannia</i> .. 48	
<i>mira</i> (<i>ligurica</i> ab.), <i>Plebeius</i> .. 68	
<i>mirabilis</i> (<i>alciphron</i> ab.), <i>Loweia</i> .. 28	
<i>misera</i> (<i>argyrognomon</i> ab.), <i>Plebeius</i> 46	
<i>mixta</i> (<i>argiolus</i> var.), <i>Celastrina</i> .. 47	
<i>mixta</i> (<i>mendica</i> var.), <i>Diaphora</i> .. 103	
<i>mnemosyne</i> , <i>Parnassius</i> 189	
<i>modeeriana</i> = <i>ferrugina</i> 163	
<i>modestella</i> , <i>Asychna</i> 202	
<i>moftartsi</i> (<i>dictynna</i> ab.), <i>Melitæa</i> .. 190	
<i>monacha</i> , <i>Lymantria</i> , <i>Psilura</i> 49, 60, 140, 211	
<i>monacharia</i> (<i>pedaria</i> ab.), <i>Phigalia</i> 140	
<i>moneta</i> , <i>Plusia</i> 60	
<i>monilata</i> (<i>phœbe</i> var.), <i>Melitæa</i> 182, 183, 184	
<i>monilataeformis</i> (<i>phœbe</i> var.), <i>Melitæa</i> 184	
<i>monochromata</i> , <i>Epipsilia</i> 97	
<i>monoglyph</i> a (<i>polyodon</i>), <i>Xylophasia</i> 36, 52, 187	
<i>monophana</i> (<i>iris</i> ab.), <i>Apatura</i> .. 114	
<i>montanata</i> , <i>Xanthorhoë</i> .. 55, 72	
<i>monticolar</i> (<i>galathea</i> race), <i>Melanargia</i> 125	
<i>Morphinæ</i> 19	
<i>munda</i> , <i>Tæniocampa</i> 211	
<i>muralis</i> , <i>Bryophila</i> 140	
<i>muricata</i> , <i>Hyria</i> 60	
<i>murina</i> (<i>pamphilus</i> race), <i>Coenonympha</i> 71, 121	
<i>mus</i> (<i>mendica</i> ab.), <i>Diaphora</i> .. 103	
<i>musculana</i> , <i>Caccœcia</i> 14	
<i>napæa</i> (<i>pales</i> race), <i>Brenthis</i> 152, 154, 155	
<i>napææ</i> (<i>napi</i> race), <i>Pieris</i> 87	
<i>napi</i> , <i>Pieris</i> 53, 56, 65, 87, 108, 112, 113, 114, 131, 135, 137, 146, 210, 225, 228	
<i>navarina</i> (<i>athalia</i> race), <i>Melitæa</i> .. 194	

	PAGE		PAGE
nebulosa, Aplecta ..	51, 92, 120, 134	ochracea (rhamni <i>ab.</i>), Gonepteryx	48, 87
neglectana, Hedyia ..	56	ochracea (zonaria <i>ab.</i>), Nyssia ..	228
neera (didyma <i>var.</i>), Melitæa	180,	ochraceella, Myrmecozela ..	24
	181, 182	ochrata, Acidalia ..	172, 173
neeræformis (didyma <i>ab.</i>), Melitæa	181, 182	**ochrearia (strataria <i>ab.</i>), Amphidasis, Pachys ..	228
nemorensis (polyxena <i>var.</i>), Thais	88	ochreata (brassicæ <i>ab.</i>), Pieris ..	88
neomyris, Satyrus ..	110, 142	ochreata (cleopatra <i>ab.</i>), Gonepteryx ..	87
neri, Daphnis ..	188, 207	ochreata (napi <i>ab.</i>), Pieris ..	87
nereus (galathea <i>var.</i>), Melanargia	125	ochrodactyla, Platyptilia ..	60
neustria, Malacosoma	92, 187, 209	octavia, Precis ..	118
nevadensis (argyrognomon <i>race</i>), Plebeius ..	46	octodurensis (boetica <i>race</i>), Erynnis	27
nevadensis (athalia <i>race</i>), Melitæa	193	octomaculata, Alypia ..	35
nictitans, Hydræcia ..	14	ocularis, Cymatophora ..	52, 59
nigra (palæmon <i>var.</i>), Cyclopides	191	ogyia (phoebe <i>race</i>), Melitæa ..	183
nigra (pales <i>ab.</i>), Brenthis ..	151, 153	oleracea, Mamestra ..	132, 134, 170
nigra (repandata <i>ab.</i>), Boarmia ..	60	omicon (reticulata <i>ab.</i>), Acalla ..	58
nigrescens (sinapis <i>var.</i>), Leptosia	87	onopordi, Hesperia	27, 81, 83, 145
nigricans, Agrotis ..	74	onopordiformis (armoricanus <i>race</i>), Hesperia ..	27
**nigricans (revayana <i>ab.</i>), Sarrothripus ..	136	oo, Dicycla ..	49, 50
nigricella, Coleophora ..	120, 202	ophiogramma, Apamea ..	74
**nigripunctata (revayana <i>ab.</i>), Sarrothripus ..	136	opima, Tæniocampa ..	60, 72
nigripunctella, Tinea ..	202	opima (urticæ <i>var.</i>), Aglais	199
nigroalterans (phoebe <i>var.</i>), Melitæa	182, 183, 184	opposita (arcania <i>race</i>), Cænonympa ..	123
nigromaculata (celina) (icarus <i>ab.</i>), Polyommatus ..	54	opposita (sylvanus <i>ab.</i>), Augiades ..	28
nigropunctata (rapæ <i>ab.</i>), Pieris ..	228	Opsiphanes ..	137
nigrorubida (didyma <i>race</i>), Melitæa	179, 180, 182	or, Cymatophora ..	49, 59, 51
niobe, Argynnis ..	171, 173, 189, 196	orana, Ino ..	7
Noctuæ ..	49, 55, 77	**orbiculoides (pendularia <i>ab.</i>), Cosymbia ..	136
Noctuidæ ..	36, 190	orbitulus, Latiiorina ..	110
norica (statilinus <i>var.</i>), Satyrus ..	128	orbona = comes ..	225
nostræ (acaciæ <i>var.</i>), Nordmannia	48	Orgyia ..	19
nostrodamus, Ggenes ..	5, 61	orientalis (ægon <i>race</i>), Plebeius ..	45
**notata (revayana <i>ab.</i>), Sarrothripus ..	136	orion, Scolitantides	131, 132, 133, 134, 170, 210
nubilalis, Pyrausta ..	134	ornata (phoebe <i>var.</i>), Melitæa ..	183
nubilata (urticæ <i>var.</i>), Aglais ..	54	osseana, Tortrix, Aphelia ..	15
nupta, Catocala ..	60, 210, 223	osseata = humiliata ..	171
Nymphalidæ ..	138	ostregiata, Cidaria ..	140
Oberthürri (boetica <i>race</i>), Erynnis ..	27	ostrina, Thalpochares ..	156
oblongata, Eupithecia ..	156	ostrinalis, Pyrausta ..	32
obscura (athalia <i>var.</i>), Melitæa	193, 194	Oxigrapa ..	164
obscura (ceto <i>var.</i>), Erebia ..	124	oxyacanthæ, Miselia ..	34, 50
obscurana (reticulata <i>ab.</i>), Acalla ..	159	palæmon, Cyclopides ..	191
obscuraria, Gnophos ..	60, 94	palestinensis, Teracolus ..	65
obscurata (baton <i>var.</i>), Scolitantides ..	29	paleacea, Cosmia ..	34, 52
obscurior (c-album <i>var.</i>), Polygonia	200	pales, Brenthis	148, 149, 150, 151, 152, 153, 154, 155
obsoleta (ligea <i>ab.</i>), Erebia ..	97	palina (pales <i>var.</i>), Brenthis	149, 154
**obsoleta (revayana <i>ab.</i>), Sarrothripus ..	136	pallens, Leucania ..	52
obsoleta (sylvanus <i>ab.</i>), Augiades ..	28	pallescentella, Tinea ..	201
obsoletella, Gelechia ..	37	pallida (aglaia <i>ab.</i>), Argynnis ..	195
occasus (didyma <i>var.</i>), Melitæa	179, 182	pallida (c-album <i>ab.</i>), Polygonia ..	200
occidentalis (didyma <i>race</i>), Melitæa	180	pallida (cardui <i>ab.</i>), Agriades ..	197
occidentalis (sidæ <i>race</i>), Hesperia ..	27	pallida (variegata) (pyramidea <i>ab.</i>), Amphipyra ..	227
occitanica (phoebe <i>race</i>), Melitæa ..	183	pallidior (c-album <i>ab.</i>), Polygonia	200
occulta, Aplecta ..	52	palpella, Ancyrolomia ..	156
ocellatus, Smerinthus ..	73, 92	paludis, Hydræcia ..	14
		palustrana, Mixodia ..	140

	PAGE
palustris (<i>didyma</i> var.), <i>Melitæa</i>	179, 181, 182
pamphilus, <i>Cænonympha</i>	54, 65, 66, 69, 71, 77, 78, 94, 104, 109, 114, 119, 121, 122, 131, 145, 147, 148, 208, 224
pandora, <i>Dryas</i>	143, 158
panormitana (<i>galathea</i> var.), <i>Melanargia</i>	125
pantaria, <i>Abraxas</i>	138
paphia, <i>Dryas</i>	34, 60, 65, 73, 77, 78, 79, 93, 99, 143, 157, 173, 186, 195, 196, 197, 207, 212
Papilio	192
papilionaria, <i>Geometra</i>	50, 74
parallelaria, <i>Epione</i>	52
pariana, <i>Hemerophila</i>	35
parthenias, <i>Brephos</i>	34, 92, 138
parthenides (<i>athalia</i> var.), <i>Melitæa</i>	194
parthenie, <i>Melitæa</i>	172, 173, 186, 193, 194
parva, <i>Thalpocharus</i>	156
parvipuncta (<i>argiolus</i> ab.), <i>Celastrina</i>	46, 47
pastinum, <i>Toxicampa</i>	20
patycosana (<i>didyma</i> ab.), <i>Melitæa</i>	181, 182
pauper (<i>cyllarus</i> race), <i>Glaucopsyche</i>	29, 206
pauper (<i>phœbe</i> race), <i>Melitæa</i>	182, 183
paupera (<i>sylvanus</i> ab.), <i>Augiades</i>	28
pavonia, <i>Saturnia</i>	36, 78, 92
pedaria (<i>pilosaria</i>), <i>Phigalia</i>	34, 119, 140, 171, 187
pelopia, <i>Castnia</i>	117
pendularia, <i>Cosymbia</i>	132, 136, 137, 211
pennaria, <i>Himera</i>	74
penumbra (<i>iris</i> ab.), <i>Apatura</i>	114
per-aurantia (<i>coridon</i> ab.), <i>Agriades</i>	77
periommatæ (<i>ilia</i> ab.), <i>Apatura</i>	190
Perisama	188
perla, <i>Bryophila</i>	14, 99, 201, 224
Peronea	164
persea (<i>didyma</i> race), <i>Melitæa</i>	181, 182
perspicillaris = <i>polyodon</i>	110
petiverella, <i>Hemimene</i>	202
petraria, <i>Lozogramma</i>	55, 171
pfeifferella, <i>Antispila</i>	202
phæus, <i>Charaxes</i>	118
phaon, <i>Papilio</i>	212
phegea, <i>Syntomis</i>	170, 171, 172, 173, 186, 188
pherusa, <i>Melanargia</i>	137
philenor, <i>Papilio</i>	212
philonomus (<i>ægon</i> var.), <i>Plebeius</i>	45, 46
philoxenus (<i>tiphon</i> race), <i>Cænonympha</i>	77
phisadia, <i>Teracolus</i>	65
phlæas, <i>Rumicia</i>	36, 54, 61, 62, 65, 69, 70, 77, 78, 94, 97, 131, 135, 147, 148, 173, 208, 224, 226
phocas (<i>dorilis</i> ab.), <i>Loweia</i>	29
phœbe, <i>Melitæa</i>	64, 107, 144, 170, 182, 183, 209

	PAGE
phœnissa (<i>cardamines</i> ab.), <i>Euchloë</i>	63
phormia (<i>jurtina</i> var.), <i>Epinephile</i>	124
phryganella, <i>Semioscopus</i>	60
phryne (<i>ilia</i> var.), <i>Apatura</i>	190
*pica, <i>Platyptilia</i>	175
picta, <i>Ceramica</i>	35
Pierida	66, 200
Pieris	147
pieretii, <i>Euxoa</i>	156
pigra, <i>Pygæra</i>	73
pilosaria = <i>pedaria</i>	34, 171, 187
pilosellæ, <i>Oxyptilus</i>	33
pilosellæ, <i>Zygæna</i>	134
pinastri, <i>Sphinx</i>	168
pinastri = <i>scabriuscula</i>	170, 187
pinguis (<i>niobe</i> var.), <i>Argynnis</i>	196
pini, <i>Dendrolimus</i>	170
pinicolella, <i>Batrachedra</i>	202
piniperda, <i>Bupalus</i>	95, 170, 171
pirata (<i>briseis</i> ab.), <i>Satyrus</i>	77
pisi, <i>Hadena</i>	170
pistacina, <i>Amathes</i>	50
plagiata, <i>Anaitis</i>	55, 57, 225
plantaginis, <i>Parasemia</i>	73, 137, 190
Plebeiidi	109
plesaura (<i>pherusa</i> ab.), <i>Melanargia</i>	187
plexippus = <i>archippus</i>	37, 57, 77, 211
plumaria = <i>ericetaria</i>	207
plumbaria, <i>Ortholitha</i>	225
**plumbea (<i>revayana</i> ab.), <i>Sarrothripus</i>	136
plumifera, <i>Ptilocephala</i>	165
podalirius, <i>Papilio</i>	108, 112, 113, 146, 170, 187
podana, <i>Cacœcia</i> , <i>Tortrix</i>	14, 57, 58, 99
polaris (<i>urticæ</i> ab.), <i>Aglais</i>	54, 79, 199
polemoniella, <i>Coleophora</i>	136
politana = <i>alpinana</i>	202
polychloros, <i>Eugonia</i>	78, 79, 80, 111, 112, 144, 145, 146, 147, 148, 187, 199, 200
polyommata, <i>Tricopteryx</i>	77
polymnia, <i>Mechanitis</i>	117
polyodon = <i>monoglypha</i>	36
polyodon (<i>perspicillaris</i>), <i>Cloantha</i>	110
**polypygas, <i>Catagramma</i>	26
polyxena (<i>hypermnestra</i>), <i>Thais</i>	88, 133, 142
pomonella, <i>Cydia</i>	20, 35
pontica, <i>Hesperia</i>	81, 82
populi, <i>Amorpha</i>	73, 78, 190, 192
porcellus, <i>Theretra</i>	135, 172
porrecta (<i>megea</i> var.), <i>Pararge</i>	126
porrecta (<i>semiargus</i> var.), <i>Polyommatus</i>	45
posteromaculata (<i>brassicæ</i> ab.), <i>posteromaculata</i> (<i>napi</i> ab.), <i>Pieris</i>	228
posticochreata (<i>brassicæ</i> ab.), <i>Pieris</i>	88
potatoria, <i>Cosmotriche</i>	53
præclara (<i>aurinia</i> race), <i>Melitæa</i>	73
præcocior (<i>baton</i> ab.), <i>Scolitantides</i>	29
prasinana, <i>Hylophila</i>	34, 50, 211

	PAGE		PAGE
prieuri, Satyrus	77	reducta (camilla var.), Limenitis	179
procida (galathea race), Melanargia		renago (oo ab.), Dicycla	50
123, 124, 134, 158, 170, 171, 172		repandata, Boarmia 50, 55, 60, 92, 212	
prodiga (camilla var.), Limenitis ..	179	reticulata (contaminana), Acalia 58,	
progemma = marginaria	138, 212	158, 159, 160, 161, 162, 163, 164, 204	
pronubana, Tortrix	99, 201, 204	revayana, Sarrothripus	76, 136
proosti (cardamines var.), Euchloë	228	rezniceki (aragionensis var.), Agri-	
protea, Hadenia	50, 135	ades	44
protea (didyma var.), Melitæa 180,	182	rhadamanthus, Zygaena	138
protesilaus, Papilio	192	rhamni, Gonepteryx 36, 48, 59, 65,	
protodamas (hyperion), Papilio ..	212	69, 93, 94, 108, 112, 131, 138,	
prunata, Lygris	74	146, 147, 172, 186, 192, 225, 226, 228	
pruinata, Pseudoterpna	18	rhamnoides (rhamni var.), Gonep-	
pruni, Strymon 18, 78, 171, 172,		teryx	228
176, 186, 206		rhamnusia (lupinus race), Epine-	
pseudospretella, Oecophora	37	phele	205
psi, Triena	92	rhamnes, Erynnis	5, 7
Psyche	165	rhombana (reticulata ab.), Acalia	
Psychidæ	80, 89	58, 158, 159, 160, 161, 164	
Psychides	165	rhombella, Gelechia	201
pudibunda, Dasychira .. 18, 34, 50		ribeana, Pandemis	58
pulchella, Utetheisa	137, 226	ripae, Rhyacia, Agrotis	156
pulcherrima (icarus var.), Polyom-		rivulana (conchana), Eucosma 32, 203	
matus	44, 45	rivularis = camilla 142, 146, 147, 179	
**pulchra (grossulariata ab.), Abrax-		robertsi (didyma var.), Melitæa ..	182
as	205, 206	roboraria, Boarmia	49, 52, 171
pulchrina, Plusia	73	romana (crameri race), Antho-	
pulchrior (polychloros var.), Eu-		charis	143
gonia	199	romana (didyma race), Melitæa	
pulveraria, Numeria .. 60, 78, 224		181, 182	
pumila (didyma var.), Melitæa ..	181	romanoides (crameri race), Antho-	
pumilus (apollo race), Parnassius ..	77	charis	143
punctidactyla, Platyptilia	175	romanorum (alciphron race),	
punica (phaëbe var.), Melitæa 183,	184	Loweia	28
purdeyi, Rhyacionia, Retinia ..	80	rondoui (escheri race), Polyomma-	
purpuralis, Pyrausta	32, 93	tus	31
pusaria, Cabera	19	rosana = reticulata	160, 161, 162
pusulata (bajularia), Euchloris ..	50	rosea (areola ab.), Xylocampa ..	191
pygmæa (galathea ab.), Melanargia		**rosea (revayana ab.), Sarrothri-	
125, 126		pus	136
pyrænaica (galathea race), Melan-		rossii (manni race), Pieris	119
argia	125, 126	rostragnoi (boetica race), Erynnis ..	27
Pyralidæ	134	rostragnoi (statilinus race), Satyrus	128
pyramidea, Amphipyra 74, 175, 227		rostralis, Hypena	56
pyrenaearia (ericetaria ab.), Seli-		rotundaria (pusaria var.), Cabera 19	
dosema	74	roxelana, Pararge	158
pyri, Saturnia	132	roystonensis (coridon ab.), Agriades	
quadripunctella, Lampronia 20, 137		58, 77	
quensellii, Orodemnia	137	rubens (polychloros var.), Eugonia 199	
quercifoliella, Lithocolletis	140	ruberata, Hydriomena	72
quercii (semiargus var.), Polyom-		rubi, Macrothylacia	60
matus	45	rubi, Callophrys 95, 112, 113, 114,	
quercus, Bithys 48, 65, 78, 142, 158		131, 132, 142	
quercus, Lasiocampa 188, 224, 225		rubida (didyma var.), Melitæa 179,	
quinqueguttella, Lithocolletis ..	203	180, 182	
radiana (hastiana ab.), Peronea ..	60	rufa (comes var.), Triphæna	74
ragusai (acteon race), Thymelicus	28	*rufescens (revayana ab.), Sarro-	
ramella, Cydia	202	thripus	136
ramosana (revayana ab.), Sarro-		rufillana, Laspeyresia	201
thripus	76	rufina (icarus var.), Polyommatus	
rapae, Pieris 18, 53, 64, 65, 66, 76,		45, 105	
92, 113, 131, 146, 148, 172, 188,		rufina = helvola	50, 224
192, 223, 225, 226, 228		rühli (ceto var.), Erebia	124
raphani (daplidice var.), Pontia ..	8	rumicis, Pharetra	52
ratzburghiana, Paedisca	33		

	PAGE		PAGE
<i>rustica</i> (<i>mendica</i> <i>race</i>), <i>Diaphora</i>		<i>sibyllina</i> (<i>coridon</i> <i>race</i>), <i>Agriades</i> ..	30
73, 101, 102, 103, 168		<i>sicula</i> (<i>athalia</i> <i>var.</i>), <i>Melitæa</i> ..	194
<i>rutilus</i> , <i>Chrysophanus</i> ..	97	<i>sidae</i> , <i>Hesperia</i> ..	27, 142
<i>sabina</i> , <i>Phrissura</i> ..	118	<i>sitanica</i> (<i>pales</i> <i>race</i>), <i>Brenthis</i> 149,	
<i>**sagittata</i> (<i>revayana</i> <i>ab.</i>), <i>Sarro-</i>		150, 154	
<i>thripus</i> ..	136	<i>**signatipennis</i> (<i>elinguaria</i> <i>ab.</i>),	
<i>salicella</i> , <i>Eucosma</i> , <i>Antithesia</i> 56,	202	<i>Crocallis</i> ..	228
<i>salmonicolor</i> (<i>urticæ</i> <i>ab.</i>), <i>Aglais</i> ..	77	<i>silacea</i> , <i>Cidaria</i> ..	49
<i>sambucaria</i> , <i>Oourapteryx</i> ..	55	<i>silphella</i> , <i>Oreopsyche</i> ..	167
<i>sanguinella</i> (<i>semirubella</i> <i>ab.</i>), <i>Sale-</i>		<i>similis</i> (<i>auriflua</i>), <i>Euproctis</i> 18, 56,	60
<i>bria</i> ..	77	<i>simillana</i> , <i>Molippe</i> ..	38
<i>sao</i> , <i>Powellia</i> ..	28, 81, 132, 144	<i>simplonia</i> , <i>Anthocharis</i> ..	186
<i>satellitia</i> , <i>Scopelosoma</i> ..	49, 51, 74	<i>sinapis</i> , <i>Leptosia</i> 87, 108, 112, 113,	
<i>satraps</i> , <i>Thersamonia</i> ..	28	131, 146, 209, 211	
<i>saturatella</i> , <i>Coleophora</i> ..	203	<i>sinerubra</i> , <i>Perisama</i> ..	188
<i>Saturniæ</i> ..	108	<i>sinuana</i> , <i>Nephodesme</i> ..	36
<i>Satyri</i> ..	147	<i>sinuella</i> , <i>Homesoma</i> ..	201
<i>Satyridæ</i> ..	54, 109	<i>sipora</i> (<i>pales</i> <i>race</i>), <i>Brenthis</i> 150,	
<i>sauberiana</i> (<i>podana</i> <i>ab.</i>), <i>Cacæcia</i>		151, 155	
14, 58		<i>smaragdaria</i> , <i>Euchloris</i> 171, 172, 224	
<i>saucia</i> , <i>Peridroma</i> ..	51	<i>socia</i> , <i>Xylina</i> ..	74
<i>saxonica</i> (<i>aragonensis</i> <i>race</i>), <i>Agri-</i>		<i>sociata</i> , <i>Xanthorhoë</i> ..	72
<i>ades</i> ..	29	<i>solandriana</i> , <i>Pædisca</i> ..	56
<i>scabriuscula</i> (<i>pinastri</i>), <i>Dipterygia</i>		<i>Solenobia</i> ..	165
170, 187		<i>solitariella</i> , <i>Coleophora</i> ..	37
<i>scalena</i> (<i>plantaginis</i> <i>var.</i>), <i>Para-</i>		<i>sorbi</i> , <i>Lithocolletis</i> ..	140
<i>semia</i> ..	156, 190	<i>sorbiana</i> , <i>Cacæcia</i> , <i>Tortrix</i> 160,	
<i>scapulosa</i> , <i>Cerocala</i> ..	156	161, 162, 202	
<i>seota</i> (<i>pamphilus</i> <i>race</i>), <i>Cænonym-</i>		<i>spartiella</i> , <i>Anarsia</i> ..	203
<i>pha</i> ..	122	<i>spartifoliella</i> , <i>Cemiostoma</i> ..	204
<i>scotica</i> (<i>aurinia</i> <i>race</i>), <i>Melitæa</i> ..	73	<i>spectrum</i> , <i>Apopestes</i> ..	188
<i>scutosa</i> , <i>Melicleptria</i> ..	156	<i>Sphingidæ</i> ..	135
<i>scutulana</i> , <i>Ephippiphora</i> ..	20	<i>sphyrus</i> (<i>machaon</i> <i>ab.</i>), <i>Papilio</i> ..	89
<i>sebrus</i> , <i>Cupido</i> 47, 70, 107, 132,		<i>spini</i> , <i>Klugia</i> ..	48
133, 143, 224		<i>splendida</i> , <i>Orgyia</i> ..	42, 79
<i>secalis</i> (<i>didyma</i>), <i>Apamea</i> ..	187	<i>splendens</i> (<i>escheri</i> <i>ab.</i>), <i>Agriades</i> ..	31
<i>secunda</i> (<i>cleopatra</i> <i>race</i>), <i>Gonep-</i>		<i>splendida</i> = <i>splendens</i> ..	31, 43
<i>teryx</i> ..	87	<i>standfussi</i> (<i>mendica</i> <i>ab.</i>), <i>Diaphora</i>	
<i>secunda</i> (<i>rhamni</i> <i>race</i>), <i>Gonepteryx</i> 48		101, 102, 103	
<i>segetum</i> , <i>Euxoa</i> , <i>Agrotis</i> ..	156	<i>statice</i> , <i>Ino</i> ..	133
<i>selene</i> , <i>Brenthis</i> 59, 76, 114, 148,	228	<i>statilinus</i> , <i>Satyrus</i> 128, 129, 142,	
<i>semele</i> , <i>Hipparchia</i> 54, 57, 65, 75,		147, 210, 223, 224, 225	
93, 94, 114, 142, 187, 208,	210	<i>statilinus</i> (<i>arethusa</i> <i>in error</i>) ..	210
<i>semiargus</i> , <i>Cyaniris</i> , <i>Polyommatus</i>		<i>statira</i> , <i>Catopsilia</i> ..	175
45, 108, 143, 170, 173,	189	<i>stellatarum</i> , <i>Sesia</i> 131, 135, 173,	
<i>semirubella</i> (<i>carnella</i>), <i>Salebria</i> ..	77	210, 225	
<i>semisebrus</i> (<i>semiargus</i> <i>ab.</i>), <i>Cyaniris</i> 189		<i>stonanus</i> (<i>revayana</i> <i>ab.</i>), <i>Sarro-</i>	
<i>semisynggrapha</i> (<i>coridon</i> <i>ab.</i>), <i>Agri-</i>		<i>thripus</i> ..	76
<i>ades</i> ..	58, 77	<i>strataria</i> , <i>Pachys</i> ..	72, 228
<i>seppella</i> , <i>Micropteryx</i> ..	12	<i>striana</i> , <i>Eucosma</i> ..	201, 202
<i>septentrionalis</i> (<i>jasius</i> <i>race</i>), <i>Char-</i>		<i>striata</i> , <i>Coscinia</i> ..	133, 137
<i>axes</i> ..	179	<i>striata</i> (<i>coridon</i> <i>ab.</i>), <i>Agriades</i> ..	208
<i>septentrionalis</i> (<i>sylvanus</i> <i>race</i>),		<i>striata-obsolata</i> (<i>coridon</i> <i>ab.</i>), <i>Agri-</i>	
<i>Augiades</i> ..	28	<i>ades</i> ..	212
<i>septiespupillata</i> (<i>cardui</i> <i>ab.</i>), <i>Pyr-</i>		<i>strigilis</i> , <i>Miana</i> ..	170, 171
<i>meis</i> ..	198	<i>strigillaria</i> , <i>Aspilates</i> ..	74
<i>serena</i> , <i>Hecatera</i> ..	73, 92	<i>stygne</i> , <i>Erebia</i> ..	124, 189
<i>serena</i> (<i>galathea</i> <i>race</i>), <i>Melanargia</i>		<i>suavella</i> , <i>Eurhodope</i> ..	15
125, 126		<i>subalpina</i> (<i>didyma</i> <i>race</i>), <i>Melitæa</i>	
<i>serratulæ</i> , <i>Hesperia</i> ..	81	179, 180, 182	
<i>sesamus</i> , <i>Precis</i> ..	118	<i>subapennina</i> (<i>escheri</i> <i>race</i>), <i>Agri-</i>	
<i>sexiespupillata</i> (<i>cardui</i> <i>ab.</i>), <i>Pyr-</i>		<i>ades</i> ..	31
<i>meis</i> ..	198	<i>subfasciata</i> , <i>Chondrostega</i> ..	156
<i>sibilla</i> (<i>camilla</i>), <i>Limenitis</i> 60, 142,		<i>subfasciata</i> (<i>alciphron</i> <i>var.</i>), <i>Lowella</i> 119	
179, 212		<i>subfulvata</i> , <i>Eupithecia</i> ..	74

	PAGE		PAGE
subroseata = decoraria	137	Thersamonia	28
subrubida (didyma var.), Melitæa		thersites, Agriades 43, 44, 68, 71,	
	179, 182		104, 105, 145
succenturiata, Epithecia	74	thetis, Agriades 14, 19, 29, 30, 31,	
suffumata, Lampropteryx	72		44, 69, 70, 78, 90, 105, 109, 118,
suffusa, Peridroma	51		131, 132, 133, 145, 148, 170, 171,
suffusa (conspersa ab.), Dianthœcia	73		173, 189, 210, 224, 225
suffusa (phlæas ab.), Rumicia ..	78	thymiaria = fimbrialis	132
suffusa (tiliæ ab.), Mimas	192	tigeliiformis (megera var.), Pararge	127
sulphurella, Dasycera	119	tiliæ, Mimas	60, 170, 192
sulphuralis = trabealis	171, 187	tincta, Apecta	51
sumatranus (glaucippe race), Hebe-		tinctoriella (saturatella ab.), Coleo-	
moia	79	phora	203
susannæ, Euproctis	7	Tineæ	135
suspecta, Orthosia, Dyschorista	49,	Tineina	33
	50, 52, 74	tiphon, Coenonympha	73, 77, 114
syllius, Melanargia	137	tipuliformis, Aegeria	92
sylvanellus (sylvanus var.), Augi-		titania, Melanargia	64
ades	107	tithonus, Epinephele 59, 65, 75,	
sylvanus, Augiades 18, 28, 65, 106,			78, 94, 110, 123, 142, 209, 210
	107, 131, 132, 144	tityus (bombyliformis), Hemaris ..	73
sylvata (ulmata), Abraxas	60, 138	torgniensis (ægon ab.), Plebeius ..	208
syngrapha (coridon ab.), Agriades		torrida (pamphilus race), Coeno-	
	58, 78	nympha	122
Syrictus (Hesperia)	174	Tortrices	135
syrictus, Hesperia	227	Tortrix	160
syringaria, Hygrochroa	78	trabealis (sulphuralis), Agrophila	
syringella, Gracilaria	57		171, 187, 224
tages, Nisoniades 58, 60, 67, 107,		transalpina, Zygaena	211
	113, 131, 135, 144	transiens (rhamni var.), Gonep-	
Taleporia	165	teryx	48
taraxici, Caradrina	52	transiens (tithonus var.), Epine-	
Tarucus	190	phele	123
taurica (cleopatra race), Gonep-		transtenuata (iris ab.), Apatura ..	114
teryx	64, 157	trapezina, Calymnia 34, 52, 74, 78,	
telamonides (marcellus var.), Pa-		tremula (dictæa), Pheosia, Noto-	
pilio	18	donta	50, 60, 73, 171
telicanus, Langia, Raywardia 5, 6,		trepida, Notodonta	60, 171
	7, 70, 143	triangula (ausonia var.), Antho-	
telmessia, Epinephele	124	charis	63
telmessiæformis (jurtina race),		triangulum, Noctua	74
Epinephele	123, 124	trifolii, Zygaena	94
telona (phœbe var.), Melitæa ..	183	trigeminana, Epiblema	15
temerata, Bapta	72	trinacriæ (minimus var.), Cupido	47
tenebrosa, Rusina	73	tringipennella, Gracilaria	201
tenuelimbo (arcania race), Cœno-		tristata, Xanthorhoë	224
nympha	123	tritici, Euxoa, Agrotis	52, 74, 156
tenuicula (athalia var.), Melitæa		trochilus, Chilades	6, 65, 99
	193, 194	truncata, Dysstroma, Cidaria 58,	
tenuis (athalia var.), Melitæa 193,			74
Tephrosia	176	tumidella = zelleri	14
Teracolus	65	turatii (escheri var.), Agriades 31,	
tertia (brassicæ var.), Pieris	88		43
tertia (cleopatra var.), Gonepteryx	87	turcica (galathea race), Melanargia	125
tertia (rhamni var.), Gonepteryx ..	48	turcica (urticæ race), Aglais	199
testaceolata (bilineata race), Camp-		tusca (phœbe race), Melitæa 182,	
togramma	137		183, 184
testata, Lygris	55, 84	tusca (tyndarus race), Erebia ..	125
teucris = heterodactyla	33	tuscanica (ægon race), Plebeius ..	45
thales (pales var.), Brenthis 153,		tutti (malvoides race), Hesperia ..	28
thausas = flava 132, 142, 173, 187,		tyndarus, Erebia	125
211		ubaldus, Azanus	6
Theclidæ	192	uhagonis (prieuri ab.), Satyrus ..	77
theophrastus, Tarucus	62	ulceratalis, Cornifrons	156
thersamon, Thersamonia 28, 62,		ulmata = sylvata	60
	64, 97, 137, 144	ulmifoliella, Lithocolletis	202
		ulopos (phaon var.), Papilio ..	212

	PAGE
umbrosa, Noctua	49, 50
unangulata, Xanthorhoë	74
undulana (revayana ab.), Sarro- thripus	76
unicoloria (erosaria ab.), Ennomos	36
unidentaria, Ochyrta, Coremia ..	55
unipuncta (aegon var.), Plebeius ..	208
universa (cardui var.), Pyrameis	197, 198
upsilon, Orthosia	60
urticae, Aglais 36, 53, 54, 56, 59, 65, 66, 77, 79, 93, 94, 111, 113, 114, 119, 131, 132, 144, 145, 192,	199, 212
uxoria, Micropteryx	11
vaccinii, Cerastis, Orrhodia 34, 49, 51, 74, 173	173
valderensis (goante race), Erebia ..	124
valesiaca (stygne race), Erebia ..	124
valesina (paphia var.), Dryas 34, 60, 77, 78, 195, 197	197
Vanessidi .. 67, 70, 145, 147, 200	200
vanillæ, Dione	20, 211
variegana, Eucosma	14
variegana, Olethreutes	115
variegana, Peronea, Acalla 77, 202	202
*variegata (revayana ab.), Sarro- thripus	136
variegata (rhamni ab.), Gonepteryx	228
variegata (rostralis ab.), Hypena ..	56
variegata = pallida	227
varissima (parthenie var.), Melitæa	194
varleyata (grossulariata ab.), Abraxas	16, 17, 34, 205
varleyata-lutea (grossulariata ab.), Abraxas	34
vau-album, Eugonia	201
vauaria, Thamnonoma 134, 187, 224	224
*vectæ (thetis var.), Agriades 29, 31, 43, 90	90
**venosa (biundularia ab.), Teph- rosia	228
vernalis (icarus var.), Polyommatus	44
vernaria, Geometra	187
versicolor (urticæ var.), Aglais ..	119
versicolora, Dimorpha	91
vetusta, Calocampa	50, 74
vetusta, Orgyia	19, 41, 78
vibicaria, Rhodostrophia 133, 170, 172	172
vibicella, Coleophora 169, 203, 204	204
viburniella, Coleophora	114
viduata (alciphron var.), Loweia ..	119
vilella, Platyedra	204
villica, Arctia 60, 78, 92, 111, 134, 170, 171, 186	186
viminalis, Cleoceris	49, 50, 52
viminiella, Lithocolletis	140
vinula, Cerura, Dicranura .. 18, 20,	73
viretata, Triopteryx	19
virgata (aprilina ab.), Agriopis ..	79
virgaurea, Heodes	97
virginica, Diacrisia	188
virida (cleopatra ab.), Gonepteryx	87
viridana, Tortrix .. 19, 75, 111, 201	201

	PAGE
viridana (iris ab.), Apatura ..	228
viridata, Nemoria	170
viridescens-marginata (coridon ab.), Agriades	29
viridissima (rhamni ab.), Gonep- teryx	48
vispardi (galathea ab.), Melanargia	125, 126
vitatha (aglaia var.), Argynnis ..	196
vittata (dolos var.), Polyommatus	119
vittata, Ctenocalpe	74
vittella, Hypsilophus	201
vulgaris (mara var.), Pararge ..	127
wailesella, Cemiostoma 201, 203, 204	204
w-album, Chastastenia 142, 172, 186, 192	192
walkeri (menthastri ab.), Spilosoma	212
woeberiana, Enharmonia	14, 58
xanthographa, Noctua	74
xanthomelas, Eugonia	199
Xenandria	117
xylostean = reticulata	159, 160
ypsilon, Euxoa	156
zancleusoides (machaon ab.), Papilio	89
zelleri, Baoris	5
zelleri (tumidella), Acrobasis ..	14
zelleri (icarus var.), Polyommatus	44
ziczac, Notodonta	73, 77, 227
zonata (halterata ab.), Lobophora ..	60
zonaria, Nyssia	228
Zygæna	108
Zygænidæ	211

MYRIOPODA.

cingulata, Polydesmus	139
lagurus, Polyxenus	21

NEUROPTERA.

Ascalaphus	137, 173
barbara, Lertha	77
bipennis, Nemoptera	77
cephalotes, Perla	99
Chrysopa	157
chrysops, Osmylus	118
cinerascens, Creagris	157
coa, Nemoptera	77
grammatica, Chloroperla	99
kolyvanensis (macaronius var.), Ascalaphus	118
libelluloides, Palpares	118
longicornis, Ascalaphus	172, 173
macaronius, Ascalaphus	118
maxima, Perla	99
Nemopteridæ	77
pallida, Halter	77
Raphidia	176
sinuata, Nemoptera	77, 118
tetragrammicus, Formicaleo	118
trigammus, Myrmecaelurus	118
tripunctata, Isopteryx	99
variegata, Nemoura	99

ODONATA.

	PAGE
annulatus, <i>Cordulegaster</i>	157
chrysostigma, <i>Orthetrum</i>	61
cærulescens, <i>Orthetrum</i>	95, 157, 187, 225
cyanea, <i>Aeschna</i>	139
cyathigerum, <i>Enallagma</i>	157
depressum, <i>Libellula</i>	172
imperator, <i>Anax</i>	157
junceæ, <i>Aeschna</i>	91
meridionale, <i>Sympetrum</i>	61
Odonata	189
Orthetrum	61
pennipes, <i>Platynemis</i>	225
pumilio, <i>Ischnura</i>	225
scoticum, <i>Sympetrum</i>	225
splendens, <i>Calopteryx</i>	91
sponsa, <i>Lestes</i>	95, 225
striolatum, <i>Sympetrum</i>	95, 157, 225
Sympetrum	61, 157
virgo, <i>Calopteryx</i>	157, 172, 173

ORTHOPTERA.

abbreviatus, <i>Gampsocleis</i>	17
albicinctus, <i>Ectobius</i>	8
annæ, <i>Gampsocleis</i>	17
auricularia, <i>Forficula</i>	37, 117
azurescens, <i>Sphingonotus</i>	156
burri (<i>lapponicus var.</i>), <i>Ectobius</i> ..	8
cærulescens, (<i>Edipoda</i>	210, 225
Callimenus	18
campestris, <i>Gryllus</i>	130, 225
caudata, <i>Gampsocleis</i>	17
chopardi (<i>lapponicus var.</i>), <i>Ectobius</i>	9
christinichi, <i>Gampsocleis</i>	17
discrepans (<i>lapponicus var.</i>), <i>Ectobius</i>	9
duskei, <i>Ectobiella</i>	8
<i>Ectobiella</i>	8
<i>Ectobius</i>	8
erythronata (<i>lapponica var.</i>), <i>Ecto-</i> <i>bius</i>	9
falcata, <i>Thaneroptera</i>	225
fernandezi, <i>Callimenus</i>	18
fuscum, <i>Stethophyma</i>	225, 226
<i>Gampsocleis</i>	17
glabra, <i>Gampsocleis</i>	17
hemiptera (<i>lapponicus subsp.</i>), <i>Ectobius</i>	8, 9
hemiptera (<i>perspicillaris subsp.</i>), <i>Ectobius</i>	8
Hololampra	8
italicus, <i>Caloptenus</i>	156
kraussi, <i>Gampsocleis</i>	17
lapponicus, <i>Ectobius</i>	8, 9
lividus, <i>Ectobius</i>	8, 9
Locusta	17
Mantis	138
miniata, (<i>Edipoda</i>	210
nicæensis, <i>Ectobius</i>	8
Næarodes	17
orientalis, <i>Blatta</i>	116

	PAGE
pallidus, <i>Ectobius</i>	8
panzeri, <i>Ectobius</i>	8
perspicillaris, <i>Ectobius</i>	8
perspicillaris (<i>lapponicus subsp.</i>), <i>Ectobius</i>	8, 9
picta (<i>lapponicus var.</i>), <i>Ectobius</i> ..	9
podolica, <i>Gampsocleis</i>	17
religiosa, <i>Mantis</i>	226
shelkovnikovæ, <i>Gampsocleis</i>	17
sovinskiyi, <i>Gampsocleis</i>	17
spinulosa, <i>Gampsocleis</i>	17
Truxalis	138
unguiculata, <i>Truxalis</i>	156
ussuriensis, <i>Gampsocleis</i>	17
verrucivora, <i>Decticus</i>	210
viridissima, <i>Locusta</i>	17
vittiventris, <i>Ectobius</i>	8, 9

RHYNCHOTA.

aberrans, <i>Pyrilla</i>	95
**abrotaniella, <i>Aphis</i>	175
ægypticus, <i>Pyrrhocoris</i>	138
Aphidæ	23, 174, 219, 222
aurita, <i>Ledra</i>	58
*beckeri, <i>Megacoelum</i>	9, 10, 22
Capsidæ	9
*capucina, <i>Lasiacantha</i>	191
cataphracta, <i>Orthezia</i>	23, 219
Cicada	115
cimiciformis, <i>Paracletus</i>	3
cinera, <i>Nepa</i>	119
cinnamopteris, <i>Pilophorus</i>	22
Coccidæ	23, 36, 38, 115, 219
communis, <i>Lygus</i>	57
corni, <i>Schizoneura</i>	23, 219
**decoratus, <i>Macropsis</i>	97
Flatidæ	96
floccosa, <i>Newsteadia</i>	23, 26, 219
formicophilus, <i>Lachnus</i>	23, 219
fuscinervis, <i>Macropsis</i>	97
**galliifolium, <i>Myzus</i>	175
galliiformis, <i>Kermes</i>	114
*gei, <i>Myzus</i>	175
hæmorrhoidalis, <i>Acanthosoma</i>	60
hyalinus, <i>Liorhyssus</i>	157
infusum, <i>Megacoelum</i> , <i>Calocoris</i> ..	9, 10
lethierryi (<i>beckeri var.</i>), <i>Mega-</i> <i>coelum</i>	10
luridus, <i>Podisus</i>	18
<i>Macropsis</i>	97
*mercurialis, <i>Myzus</i>	175
militaris, <i>Lygæus</i>	157
montana, <i>Cicada</i>	93
nassatus, <i>Macropsis</i>	97
perplexus, <i>Pilophorus</i>	22
persicæ, <i>Leucanium</i>	4
<i>Pilophorus</i>	10, 22
plantaginis, <i>Aphis</i>	23, 219
**populi, <i>Macropsis</i>	97
prasina, <i>Pentatoma</i>	119
quercus, <i>Kermes</i>	116
sphagni, <i>Pseudococcus</i>	26
vastatrix, <i>Phylloxera</i>	20

STREPSIPTERA.

PAGE

ZORAPTERA.

PAGE

**Eoxenos .. . . .	..	..	175
**laboulbenei, Eoxenos ..	..	..	175

ceylonicus, Zorotypus ..	..	37
guineensis, Zorotypus ..	..	37
hubbardi, Zorotypus ..	..	37
javanicus, Zorotypus ..	..	37
neotropicus, Zorotypus ..	..	37

THYSANURA.

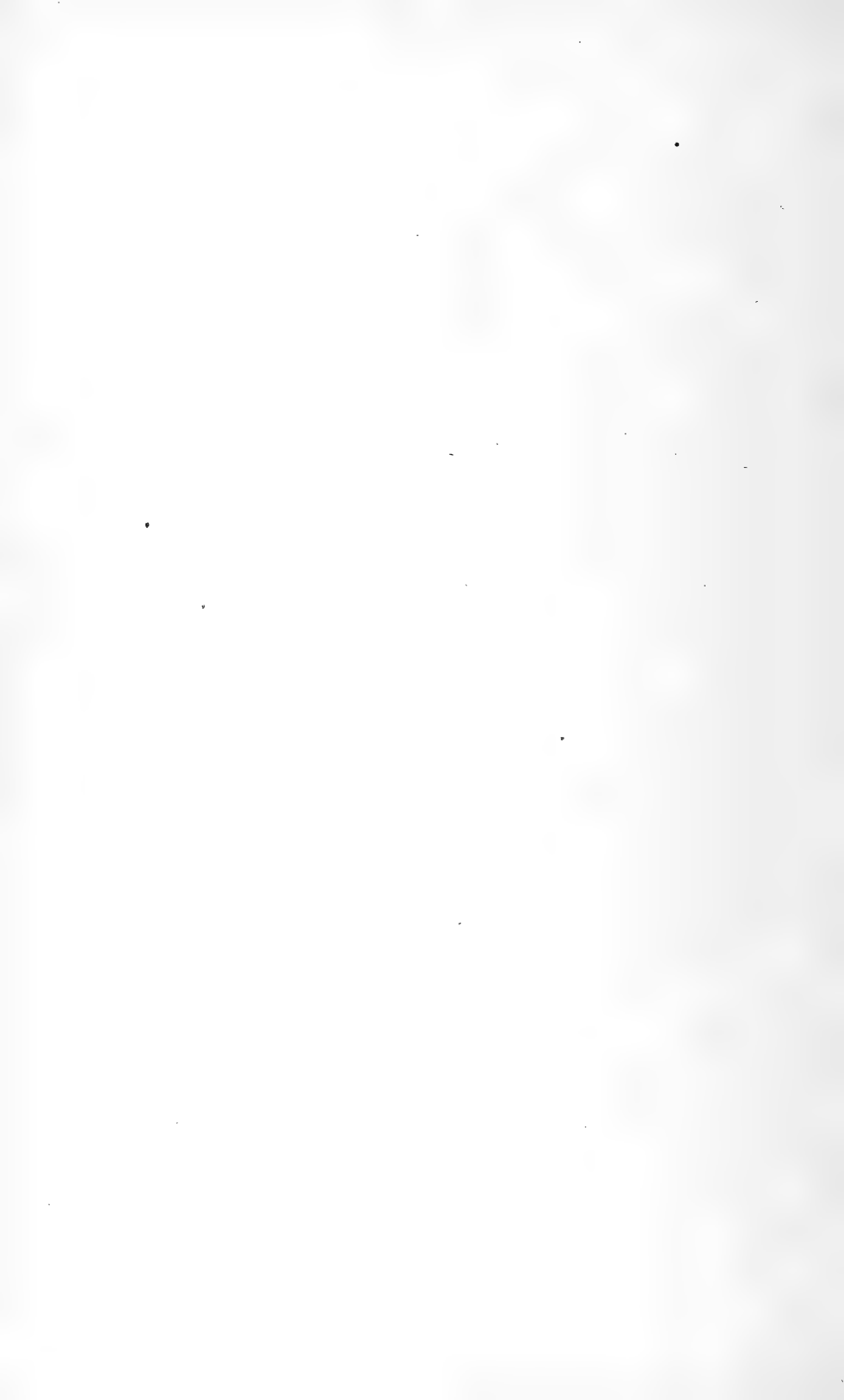
**devoniensis, Campodea	37
----------------------------	----	----

canceroides, Chelifer ..	..	139
Synapta .. . . .	..	139

CORRIGENDA, Etc.

Corrections in spelling of scientific names are made in the Special Index.

Page	5, line	11.	For "tides" read "Niles."
"	5, "	17.	For " <i>Tarucus</i> " read " <i>Langia</i> ."
"			For " <i>Zizera</i> " read " <i>Zizeeria</i> ."
"	27, "	17.	For "less greenish" read "variegated."
"	27, "	25.	For "unknown" read "only found once."
"	28, "	44.	After "female" insert "chiefly belongs to the form <i>intermedia</i> , Stel. which."
"	28, "	48.	For "some" read "only a few."
"	29, "	11.	For " <i>bleusei</i> " read " <i>cleusei</i> ."
"	30, "	31.	After "characters" insert "as compared with the nymotypical one."
"	30, "	41.	For "mm" read "m."
"	31, "	9.	After "are" insert "always."
"	31, "	12.	For " <i>vestae</i> " read " <i>vectae</i> ."
"	31, "	17.	For " <i>splendida</i> " read " <i>splendens</i> ."
"	37, "	7.	For " <i>Galium</i> " read " <i>Stellaria</i> ."
"	43,		Corrections and Emendations.
"	62, "	28.	For "Ramlem" read "Ramleh."
"	93, "	48.	For "2000" read "1800."
"	65, "	9.	For "Aka" read "Akaba."
"	65, "	14.	Del. "race."
"	72, "		For "posterior" read "anterior."
"	87, "	28.	After "mihi" insert lines 38 to 41 "In Sicily..AMPLA."
"	121,		Corrections and Emendations.
"	157,		Corrections and Errata.
"	191, "	28.	For "font" read "fount."
"	210, "	39.	For " <i>arethusa</i> " read " <i>statilinus</i> ."
"	211, "	10.	For "Ireland" read "the county."
"	222, "	25.	Correction.



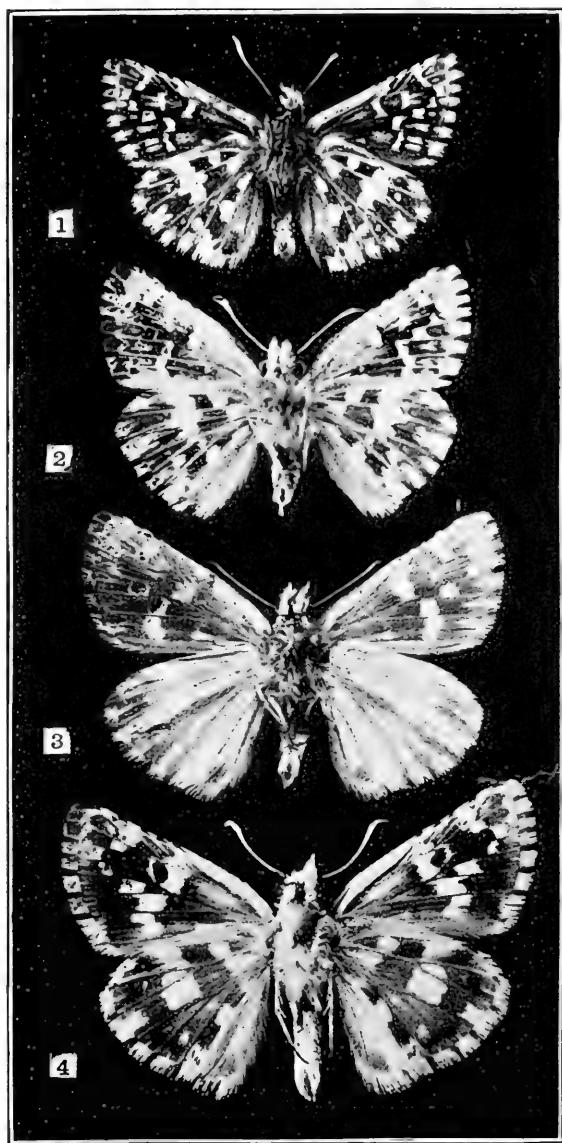


Photo A. E. Tonge.

HESPERIA, UNDERSIDES. 1, MALVAE. 2, MALVOIDES. 3, MELOTIS.
4, CYNARAE, $\times 2$.

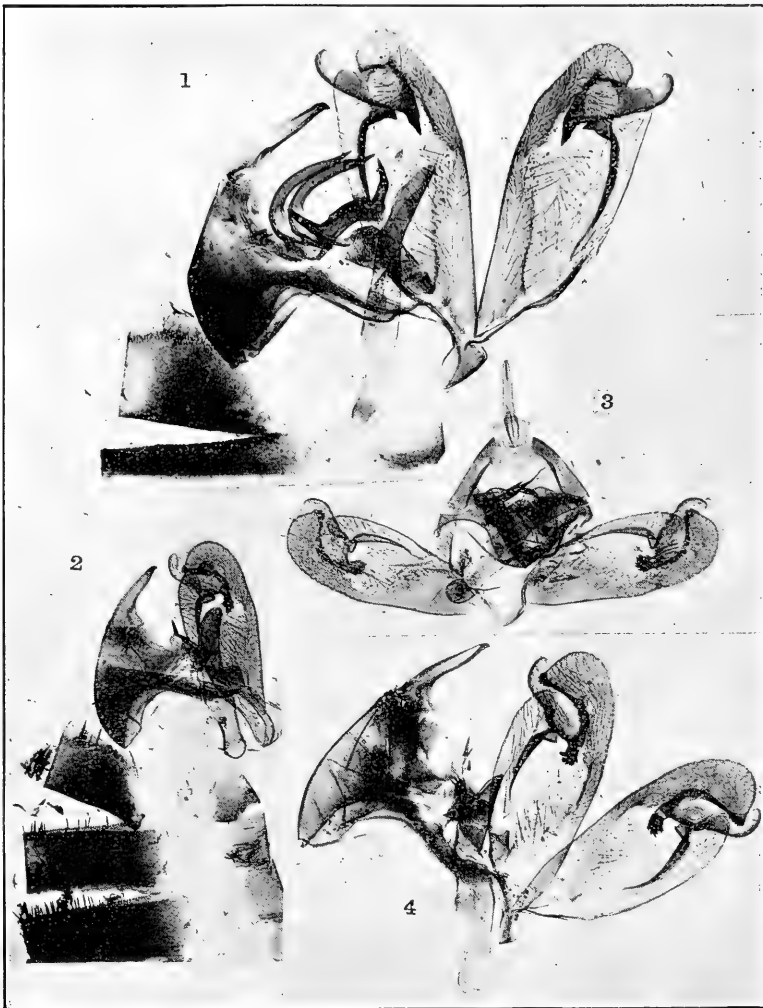
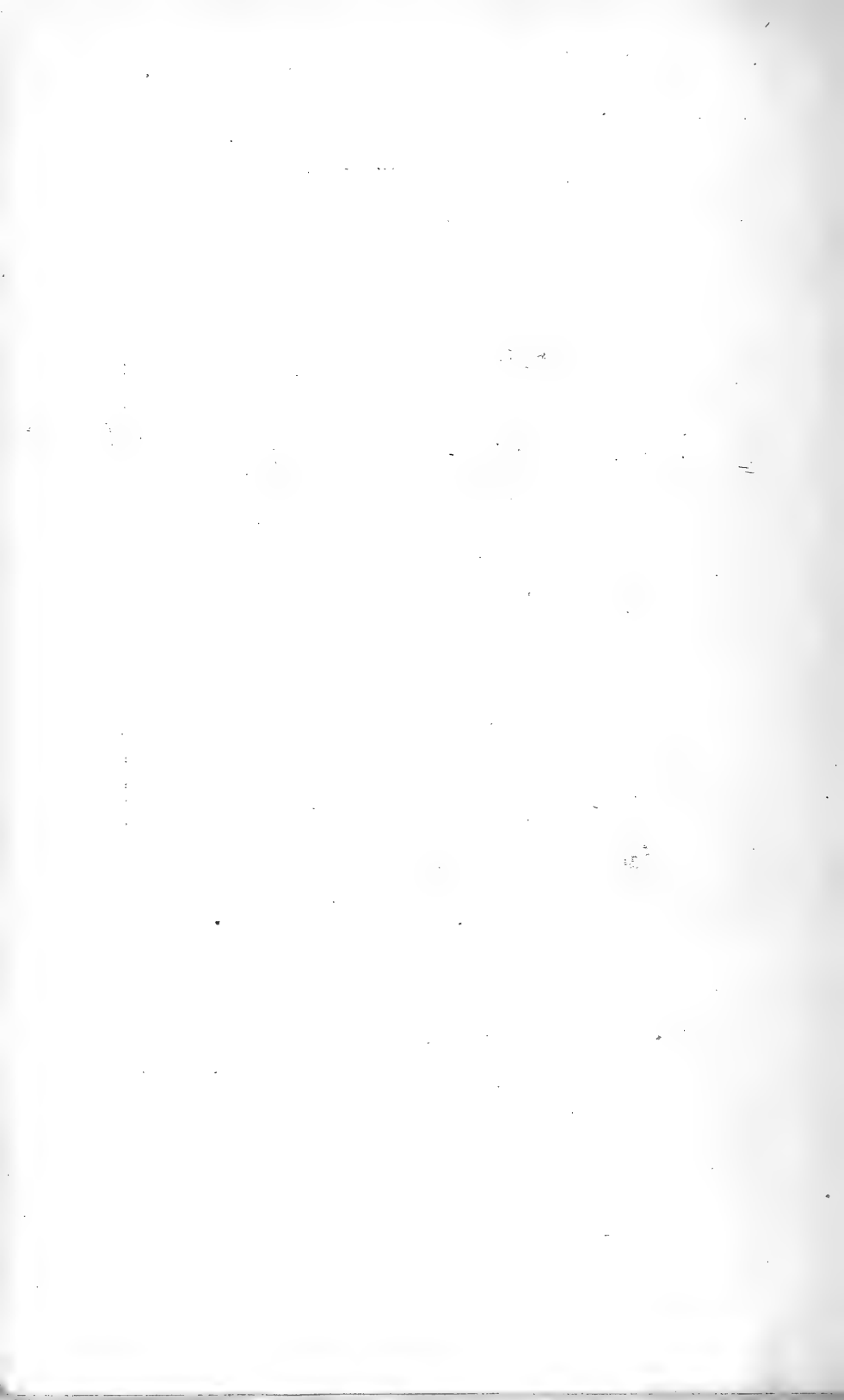


Photo F. N. Clark.

HESPERIA, ARMATURES. 1, MELOTIS, $\times 20$. 2, 3, MALVOIDES, $\times 15$.
4, MALVOIDES, $\times 30$.



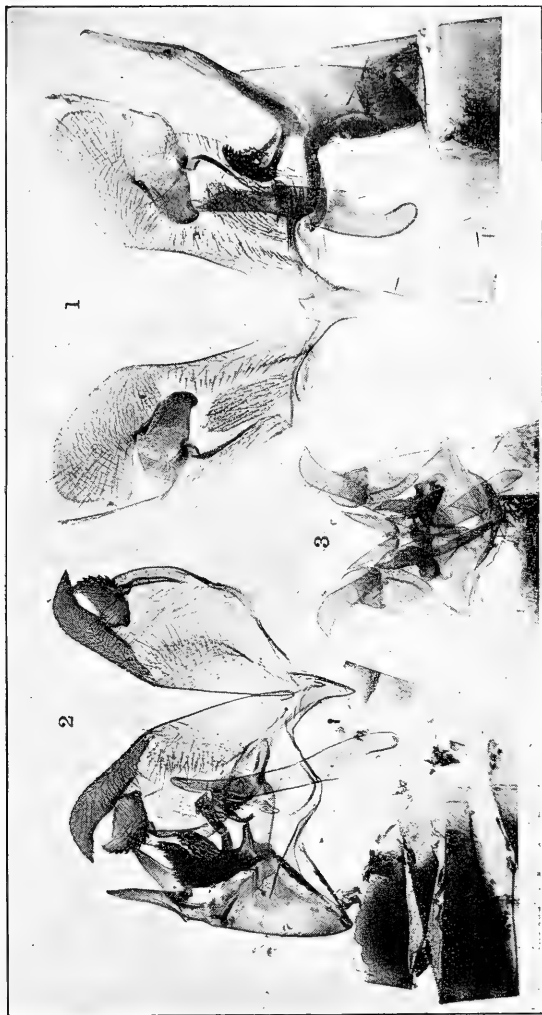
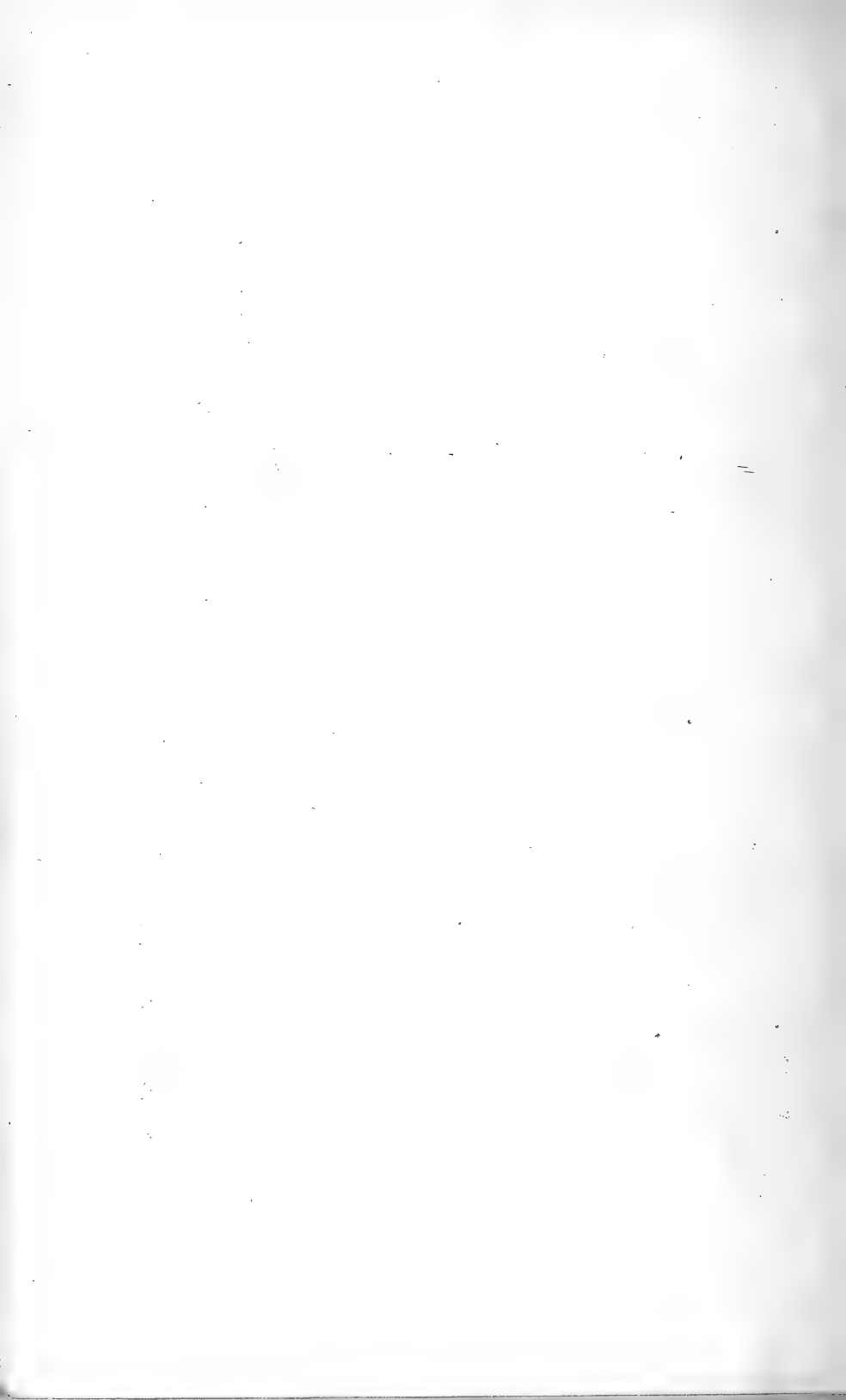


Photo F. N. Clark.

HESPERIA, ARMATURES. 1, CYNARAE. 2 AND 3, MALVAE, ALL $\times 15$.

The Entomologist's Record.

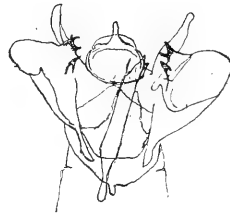




Vanessa io



Agriades coridon



Abraxas grossulariata

del. C.R.N.B.

DWARF LEPIDOPTERA.

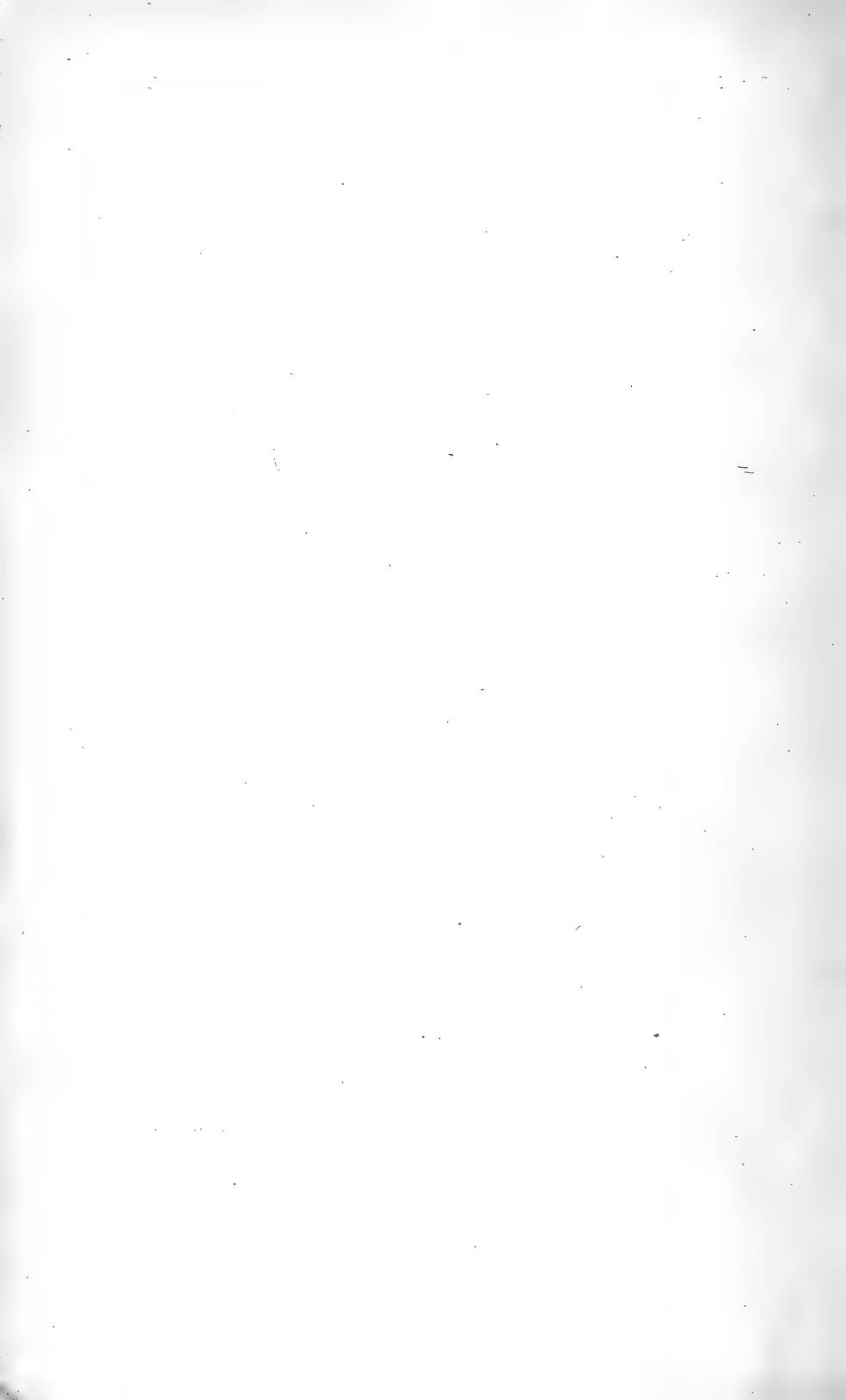


fig 1.

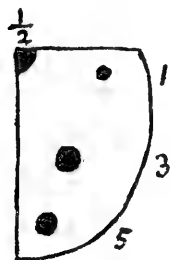


fig 2.

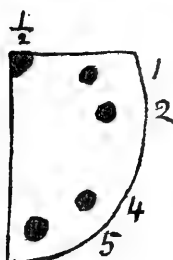


fig 3.



del. G.B.C.L.

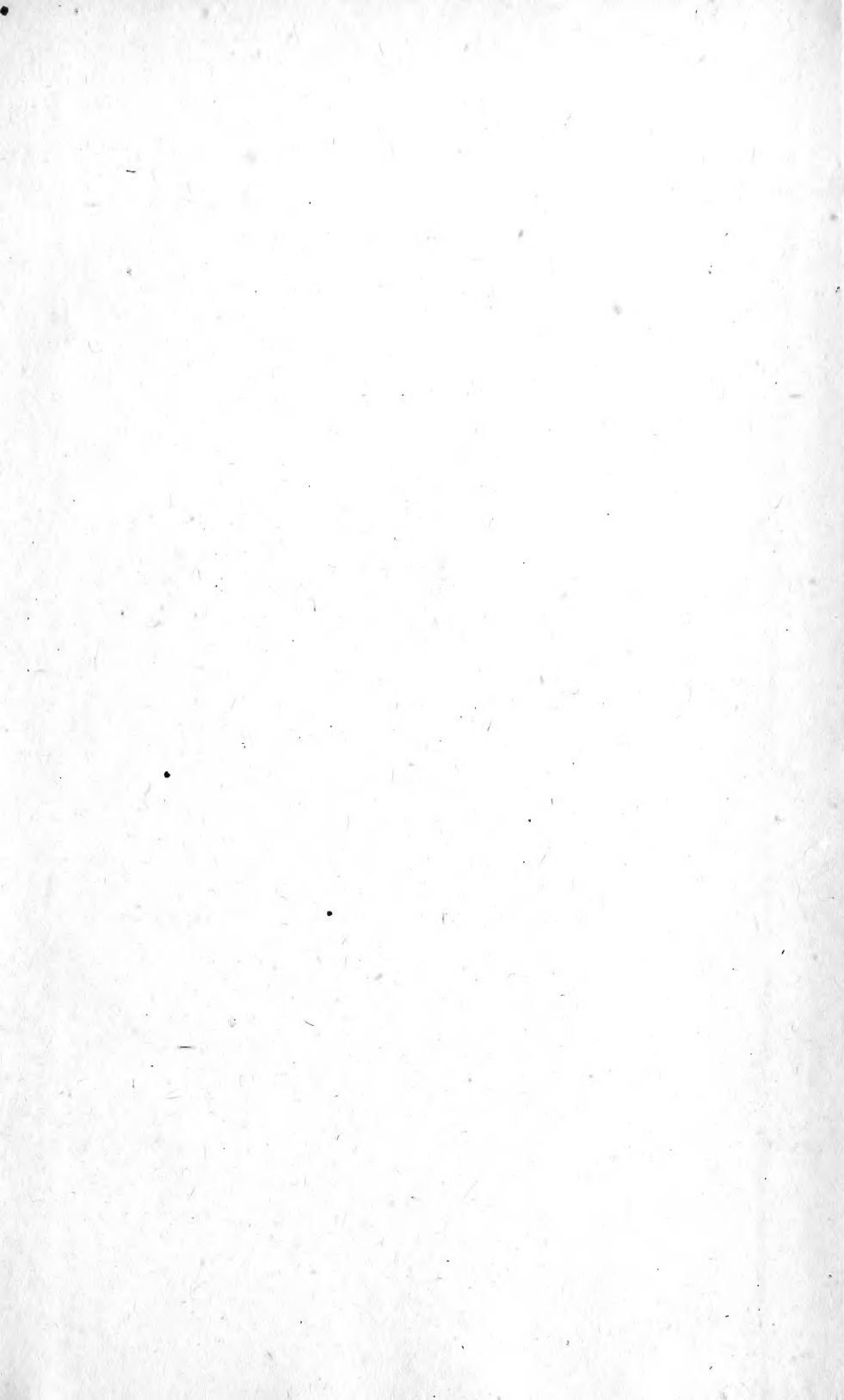
Fig. 1. COCCINELLA 11-PUNCTATA, L. AB. BINISEQUIPUNCTATA, N.AB.

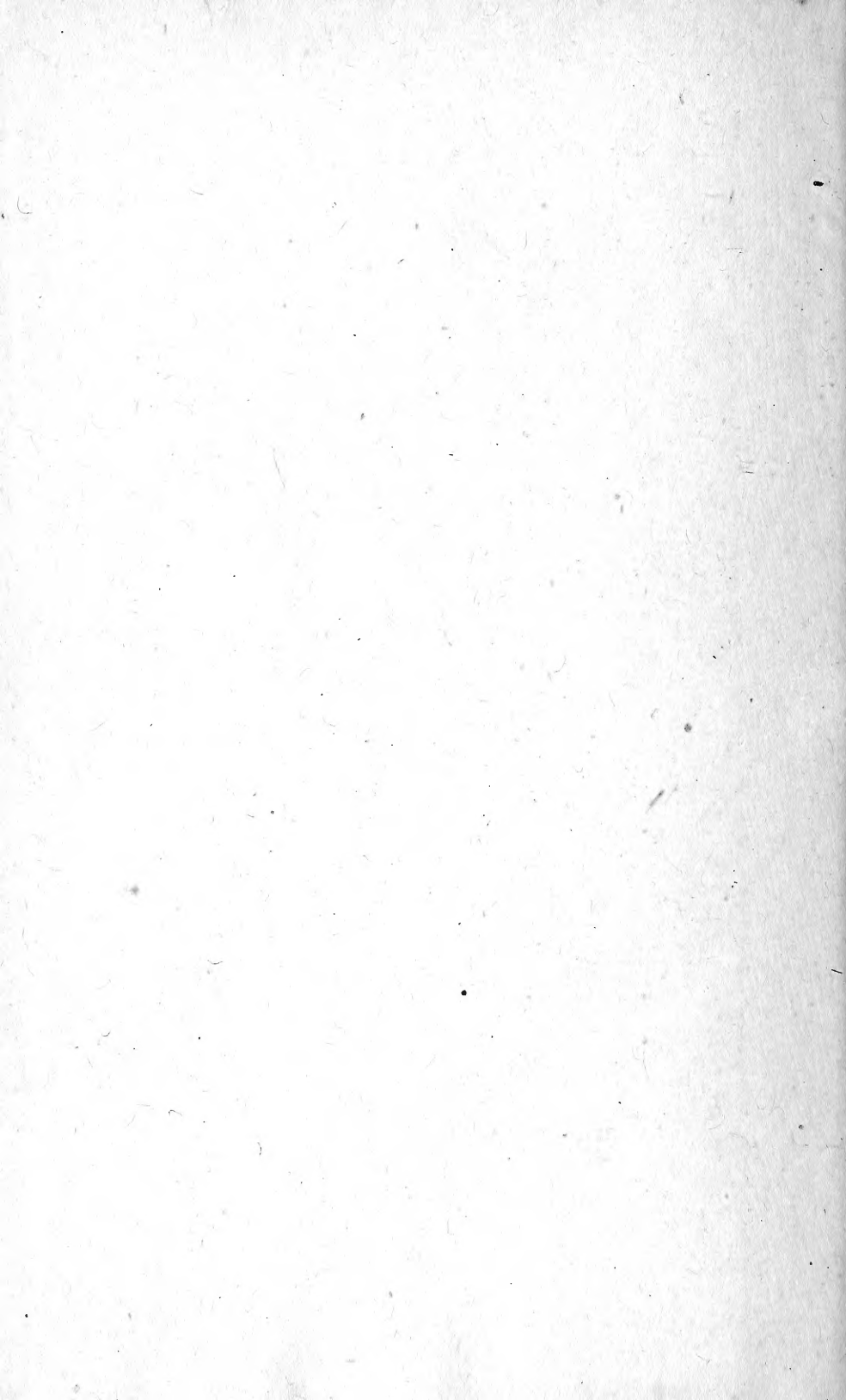
Fig. 2. „ „ AB. TRINISEQUIPUNCTATA, N.AB.

Fig. 3. ADALIA BIPUNCTATA, L. AB. DONISTHORPEI, N.AB.

(diagrammatic, enlarged.)







ERNST MAYR LIBRARY



3 2044 114 198 252

